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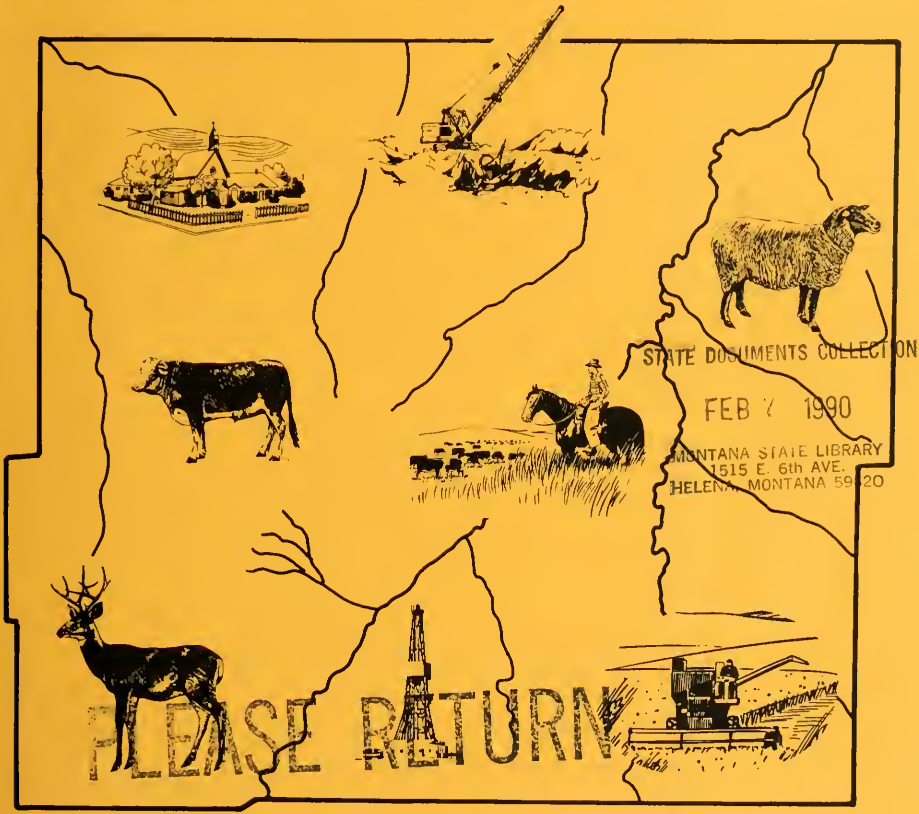

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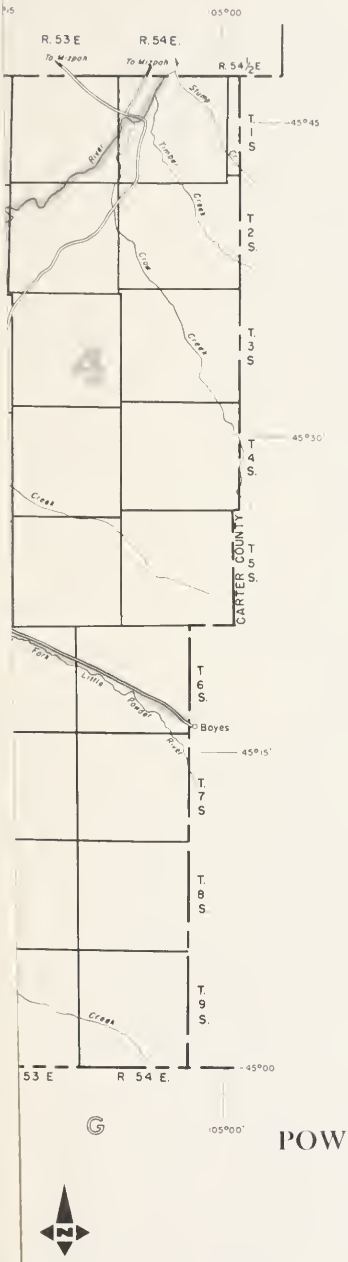

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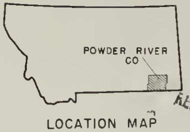

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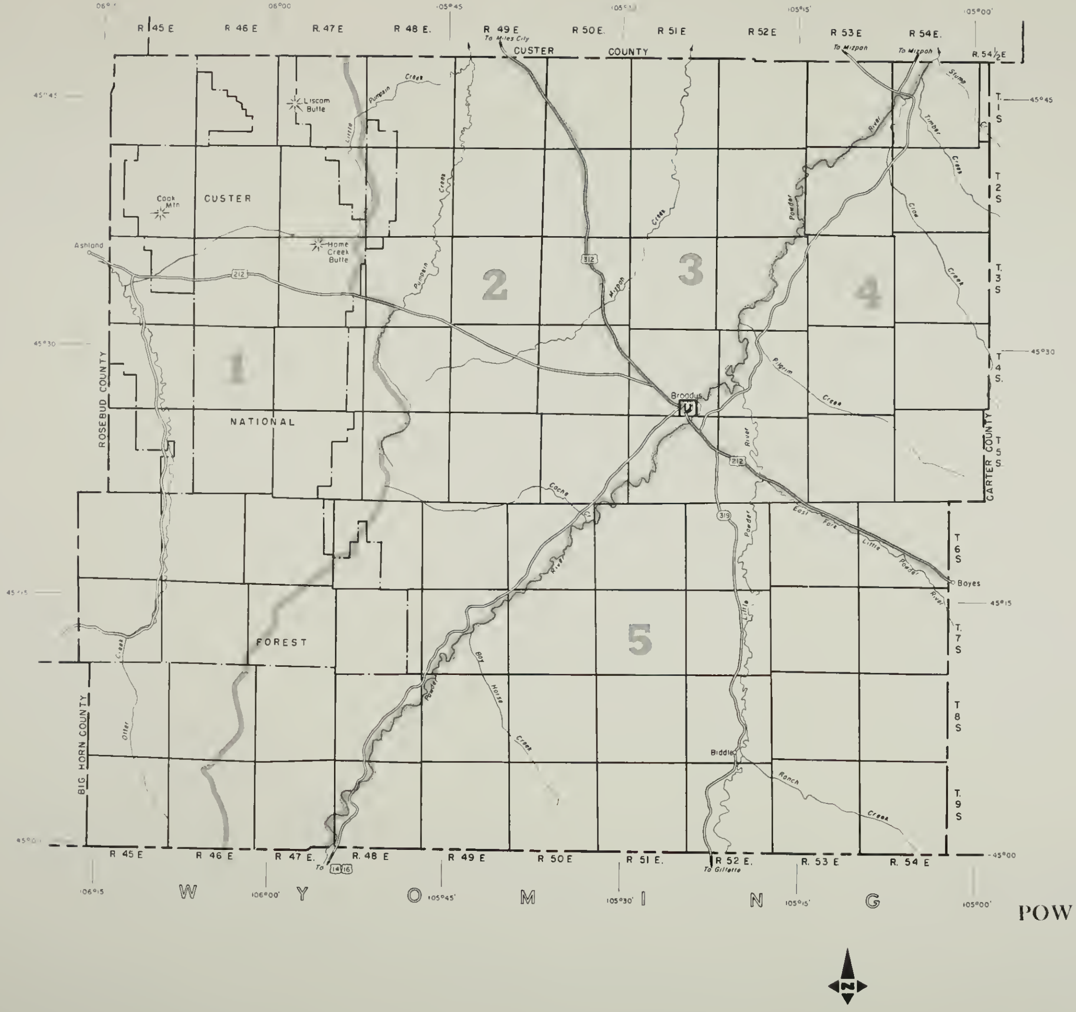

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M7-EN-23403-8

FOREWORD

The Powder River County Conservation Program is a guide to assist the district supervisors and others with the over-all development of the natural resources in the county. This program was prepared by the Board of Supervisors, with assistance from numerous individuals, groups, local, state and federal agencies.

Section I deals with the over-all operations of the district program including authorization, history, and responsibilities of the governing body.

Section II outlines the policy as adopted by the district board. These statements provide the direction for development of district resources.

Section III includes an inventory of the resources in the district and presents a detailed analysis of the current resource situation.

Section IV outlines the broad objectives, goals and priorities which the district will strive to achieve through the implementation of this program.

Section V identifies various problems and opportunities which exist in the district. These will be reviewed and used by the board as a reference for developing their annual plan of work.

Section VI deals with various alternatives available to the district to use in implementing this program to attain the goals they have established.

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WHAT IS CONSERVATION?

Conservation means many things to many people. Perhaps an appropriate definition is:

> "The wise use of natural resources to serve the greatest number of people over the longest period of time while maintaining quality of environment."

Modern soil and water conservation concepts include the multiple use of natural resources--used for the maximum benefit of man both now and in the future. Conservation and wise use of our natural resources refers to all natural resources associated with our soil and water. This includes vegetation, forests, wildlife and recreation assets as well.

Whether you are rural or urban, you have an interest in our natural resources and their wise use and improvement now and in the future. Almost everything we eat, much of the clothing we wear, our lumber, plastics, chemicals and other things in common use come from the land. It follows that the wealth of our state and nation depends upon the productivity of the soil, water and other allied natural resources.

BASIC CONCEPTS AND OBJECTIVES

1. The conservation and orderly development of resources is urgent now and will become increasingly so as population pressures on the land and water increase.

2. Responsibility for initiation and leadership of conservation and resource development should rest with people in their own communities.

3. (Soil and Water) Conservation District have proven to be the most effective form of local self-government for conservation and orderly resource development.

4. It is a function of federal, state, and local governments to assist individuals, and units of government carry out soil and water conservation work they cannot do alone.

5. Soil and water conservation is the keystone of environmental quality and resource development.

6. Effective soil and water conservation combines scientific use and treatment of land in accordance with its needs and capabilities. It recognizes the operating goals of the owner or user and is in harmony with total resource conservation and development and ecological requirements of the community, area or region.

7. Soil and water conservation includes the multiple use of resources with the objective that all uses contribute to a healthy, pleasant environment for people.

8. Soil and water conservation takes into account all natural resources and their effective use for economic and social welfare of people who live and work in the community, area or region.

9. Conservation and resource development is a task that districts cannot accomplish by themselves. It requires the joint efforts of many federal, state and local agencies and groups to help local people in districts development and accomplish their conservation and resource needs and objectives.

WHAT IS A CONSERVATION DISTRICT?

It has often been said that: "Conservation districts are democracy at work." The accepted principle in the operation of all districts is: "Conservation and resource development by the people."

Montana Conservation Districts are:

1. Organized and operated under the State Conservation Act originally passed in 1937 and recently revised in 1971.

2. Organized by a vote of the people within the district.

3. Legal subdivisions of the state, and public bodies, corporate and politic with Certificate of Organization issued by the Secretary of the State of Montana.

4. Managed by Boards of Supervisors of which five are elected by local people and two are appointed by the cities and towns, where cities and towns have been voted into the district.

5. Assisted by many agencies, organizations, groups and individuals.

Districts provide a means for all interested people in a community, area or region to work together for natural resource conservation and development.

TABLE OF CONTENTS

Page

Forward.................................. i
What is Conservation?.......................... ii
What is a Conservation District?............... iii
Table of Contents.............................. iv

Section I

Purposes

A. General.................................. 1
B. Purposes................................. 1
C. Jurisdiction............................. 3
D. Method................................... 3
E. Authorization............................ 4
F. Organization, location and acreage... 6
G. Conservation District Assessments.... 7
H. Responsibilities......................... 7

Section II

District Policy.............................. 8

Section III

Inventory

A. Climate.................................. 10
B. Geology.................................. 20
* Geology Map.............................. 22
* General Soils Map....................... 23
C. Soil Association......................... 24
D. Acreage by Landscape.................... 25
E. Land Capability Classification....... 26
F. Land Ownership........................... 29
* Land Ownership Map...................... 30
G. Water Resources......................... 31
* Surface Water Resource Map........... 33
H. Drainage Area in Powder River Co..... 34
I. Severe Erosion Hazard Area........... 35
* Severe Water Erosion Area Map........ 36
J. Fish and Wildlife Resource........... 37
* Wildlife - Upland Game Birds Map..... 39
* Wildlife - Big Game Map.............. 40
K. Mineral Resources....................... 41
* Mineral Resource Map................... 43
L. Land Use................................. 45
* Land Use Map............................ 46
M. Conservation Plans...................... 47
N. Rangeland Resource...................... 48
* Range Resource Map..................... 49
O. Dry Cropland............................ 50
P. Agricultural Income.................... 52

Inventory con't. Page

Q. Recreation and Historic Areas........ 55
* Recreation and Historic Areas Map.... 56
R. Community Facilities................. 57
S. Traffic Flow......................... 58
T. Transportation and Marketing......... 59
U. Taxation............................. 60
V. Population........................... 61
W. Population Trends and Projections.... 62
X. Income............................... 63

Section IV
Policies, Goals and Objectives

A. Education and Inventory.............. 65
B. Human and Economic Resources......... 66
C. Cropland............................. 67
D. Minerals............................. 68
E. Rangeland............................ 69
F. Water Resources...................... 70

Section V
Problems and Opportunities

A. Planning and Development............. 71
B. Cropland Resources................... 73
C. Range................................ 75
D. Pasture and Hayland.................. 79
E. Water Resources...................... 80
F. Mineral Resources.................... 82
G. Recreation and Historic Areas........ 83
H. Fish and Wildlife Resources.......... 84
I. Other land........................... 85
J. Human and Economic Resources......... 86

Section VI
Implementation and Adoption

A. Implementation....................... 87
B. Adoption............................. 91

PURPOSES

A. General

The Powder River Conservation Program is a local plan of action to assist conservation district land occupiers with soil and water conservation and related natural resource uses based on land capability. The conservation district program serves in part and contributes to:

1. Resource conservation and development planning;
2. Comprehensive land use planning;
3. Environmental enhancement planning; and
4. Pollution abatement planning.

The program includes:

1. Obtaining and reacting to public involvement;
2. Establishing policy;
3. Inventorying and analyzing the resources;
4. Determining objectives and goals;
5. Establishing priorities;
6. Recognizing problems and opportunities for wise use and development.
7. Coordinating the implementation efforts of cooperating land occupiers and many resource groups and agencies;
8. Securing financing, technical and other assistance;
9. Continuing evaluation and updating to reflect changing situations.

B. Purposes

1. Soil Conservation

The primary purpose of the district is preventing soil erosion. In doing this, the district necessarily becomes involved in water conservation, rangeland management, forestry and all related land uses.

Assistance has come primarily from agricultural agencies. It is anticipated that other agencies and programs, such as the Department of Housing and Urban Development, the Environmental Protection Agency and the Federal Revenue Sharing Program, may provide more assistance.

Increased pressures and demands for land as a place to live, work and play are expanding the district's role. The district has traditionally been oriented toward agriculture, for this is the use to which most land and water has been put.

Coupled with this public pressure for a wider diversity of uses is the increasing demand for a quality environment. Consequently, additional purposes of this program are to plan measures for pollution control and abatement to include ecological consideration of the multiple use concept as opposed to single use, plus an evaluation of trends toward public ownership and the various methods or regulation that might be used to effect proper land use. Soil conservation also gives emphasis to enhancement of water quality, natural beauty, and wildlife; preservation of scenic qualities, historic sites, and unique natural areas; and improvement of environmental health, job opportunities and education of the public.

2. Administrative Guide

This program will serve as an administrative guide for supervisors and is an outline of the means wherby the board of supervisors hopes to coordinate efforts for the orderly management of the natural resources on all lands in the district.

3. Reference

This program will serve as a reference for technicians, county commissioners, land use planners, community planners, researchers, educators and others working with the district.

4. Annual Work Plan

This program will serve as a basis for developing the District Annual Plan of Operations.

5. Information

This program will serve as the basis for an information program. Information will be directed to the public, particularly electors, cooperators, land owners-managers-occupiers-developers, legislators, county commissioners, conservation agencies and organizations, schools, churches, libraries and planning development agencies.

6. Problems and Opportunities

The district program identifies the conservation problems and opportunities recognized by supervisors, cooperating agencies and advisory groups and outlines measures to correct the problems and/or develop wise management of natural resources. This program attempts to give a history of the district. It also explains and evaluates the present condition of the natural resources (soil, water, vegetation, and wildlife), and the opportunities that exist to protect and develop these resources. It further defines policies, goals and objectives, and working procedures of the supervisors. This program gives consideration to all private and public lands.

C. Jurisdiction

1. Private Lands

Basically the district program has jurisdiction in the private ownership land area and deals with water, soil and related resources. It has, as overall objectives, the treatment of each acre according to its needs and the use of each acre within its capabilities.

2. Public Lands

Mutual problems and opportunities for the conservation, development and use of public lands are intended to be correlated with the public land administrators, managers, and users.

D. Method

Land occupiers voluntarily sign cooperative agreements to develop and carry out a conservation plan with such help and assistance as may be provided by the district and other agencies working through the district. There are also mandatory provisions in the conservation district law for land use regulations and sediment control.

E. Authorization

The district program is authorized under the provisions of Montana Conservation Districts Law 76-101 to 76-117 and 76-201 to 76-233, Revised Codes of Montana as amended, particularly Section 76-108 (8) and is required as part of Memorandum of Understanding or other appropriate Agreements the district has and is authorized to cooperate and receive assistance from:

U.S. Department of Agriculture date December 1963.
Soil Conservation Service dated October, 1969.
Dept. of Interior - BLM dated October, 1966.
Montana Department of Natural Resources and Conservation dated May 1974.
Montana Fish & Game Commission dated January, 1970.
Montana Commission of Lands & Investments dated, 1970.

Informal working relations have been established, or are desired, for cooperation and assistance from the following:

Federal
- U.S. Department of Agriculture
  - ASCS
  - FHA
  - ARS
  - FCIC
- U.S. Department of Interior
  - Bureau of Land Management
  - Bureau of Outdoor Recreation
  - Bureau of Reclamation
  - Bureau of Sports Fisheries and Wildlife
- U.S. Department of Health, Education and Welfare
- U.S. Department of Commerce
  - Office of Economic Opportunity
- U.S. Department of Housing and Urban Development
- U.S. Environmental Protection Agency
- U.S. Army Corps of Engineers

State
- Montana Highway Commission
- Montana Environmental Protection Council
- Montana Department of Intergovernmental Relations
- Montana Department of Health and Environmental Sciences
- Montana Department of Fish and Game
- Montana Extension Service
- Montana Department of Lands

Non-Governmental

Associations of resource interests such as developments groups, banks, churches, youth groups, civic groups, etc.

Local

County Commissioners
Town of Broadus
County Planning Boards
Superintendent of Schools
School Districts

Other major laws which relate to the district program:

1. P.L. 46, Soil Conservation and Domestic Allotment Act of 1936. (USDA Secretary's Memorandum No. 1488 of February 1, 1962);
2. P.L. 566, Watershed Protection and Flood Prevention Act of 1954;
3. P.L. 87-703, Section 102 of the Food and Agriculture Act of 1962, Resource Conservation and Development program;
4. P.L. 91-190, National Environmental Policy, January 1, 1970.
5. P.L. 92-500, Federal Water Pollution Control Act of 1972;
6. P.L. 92-419, Rural Development Act of 1972;
7. P.L. 93-86, Title X, Agriculture and Consumer Protection Act of 1973;
8. Water Quality Rules and Regulations of Department of Health and Environmental Sciences;
9. Floodplain Rules and Regulations of Montana Department of Natural Resources and Conservation;
10. Subdivision Regulations of the Montana Department of Inter-governmental Relations and County Commissioners;
11. Montana Streambed and Land Preservation Act;
12. Montana Water Use Act;
13. Montana Renewable Resource Act (HB 642)

F. Organization, location, acreage

The Powder River Soil Conservation District came into existance through the efforts of Dean Reder, a local rancher who lived on Butte Creek. The first district included land laying mostly in the Biddle area. An election was held on August 29, 1953 at the Biddle Store "at which a considerable number of votes were cast and only one against the district". Then on December 17, 1953 the Secretary of State at Helena declared the district "duly organized as a governmental subdivision of this State and a body coporate and politic."

The first two supervisors were O.D. Reder and J. Fred Toman. The State Soil Conservation Committee appointed Mr. Reder for a one year term and Mr. Toman for a two year term. These two supervisors then organized an election on February 27, 1954 at which three more supervisors were elected for a three year term. Those elected were James Hewitt, Howard Allen and William Eaton.

The first official meeting was held on April 15, 1954 at the Biddle Community Hall. The meeting was largely devoted to organizational matters. O.D. Reder was chosen Chairman of the Board; William Eaton, Vice-Chairman; and J. Fred Toman, Secretary-Treasurer.

Membership of the new district included only 29 ranchers, but it wasn't long until new petitions came in from ranchers wanting to join the district. So on August 7, 1954 another election was held and this increased the membership from the original 29 to 83. Now the land included in the district was scattered quite widely about the county.

No organization can carry on an effective program without some type of financial backing and this was the most pressing problem of the new district. In 1955 the Soil Conservation Service gave the district a surplus dirt scraper. Finding it too large for anyone locally to use it was sold to a man who had previously hired it from the Soil Conservation Service. It brought a goodly sum and that solved the financial problems of the District for the time being at least.

The next major event in the history of the Powder River Soil Conservation District was the inclusion of the western portion of the county into the district. Up until this time all the townships on the western side of the county belonged to the Rosebud District. But on July 19, 1958 another election was held in Ashland. At this time the residents of the western townships voted in favor of severing their ties with the Rosebud District and coming in with the Powder River District.

In 1958 the District succeeded in getting the Great Plains Program established in the county. The 1959 Annual Report of the District states that "this program has proven itself to be a very effective means of getting good and complete conservation on the land."

On February 14, 1962, Frank Murray, Secretary of State signed a certificate declaring that the Powder River Soil Conservation District had legally changed it's name to the Powder River Soil and Water Conservation District. The District supervisors then filed a notice with the Powder River Clerk and Recorder that the district includes "All lands lying within Powder River County, but excluding any incorporated towns or cities."

In early 1968 the town of Broadus petitioned the State Soil Conservation Committee for inclusion in the District. In April 1968 the residents of Broadus voted formally to become part of the District. With this event the total acreage of the district was 2,102,400 acres.

In July 6, 1971 a resolution was adopted by the board of Supervisors officially changing the name from the Powder River Soil & Water Conservation District to the Powder River Conservation District. These changes reflect the districts' increasing responsibilities in the areas of Resource Conservation and Development.

G. Conservation District Assessments and Funds

In order to accomplish the conservation needs and administration of the Conservation District, the commissioners may annually levy an assessment on the taxable real property within the district, not to exceed 1½ mills.

H, Responsibilities

Supervisor Responsibilities and Authorities:

The supervisors are elected by the qualified electors within the district. They are the governing body of the Conservation District with broad authorities as outlined in the Conservation Districts Law to develop and carry out a resource conservation and development program with the use of all available resources and authorities that they choose to use and can obtain. It is the policy of the district to cooperate with and use the services of other agencies for technical, educational, planning, research, and financial assistance to private land occupiers to plan and apply conservation practices.

POLICIES

It is the policy of the Powder River Conservation District to involve the public and cooperators to carry out the program of the State of Montana and the district with respect to the conservation of the soil and water resources and for the control and prevention of soil erosion, prevention of floodwater and sediment damages, furthering the conservation, development, utilization and disposal of water. It shall further be the district's aim to prevent and to control floods, prevent impairment of dams and reservoirs, protect the tax base, protect public and private lands, to assist in the carrying out of the environmental policies and programs of the state relative to natural resources and to assist in the carrying out of land use policies and regulations as provided in various state and federal statutes.

Specifically, the Powder River Conservation District adopts the following policy for their resource planning program:

A. Encourage an accelerated education and information program to convey a basic understanding of the need for proper land use to all segments of society. Land use policies and plans must be developed with broad public involvement to ensure citizen support and understanding.

B. Consideration will be given to the needs and desires of the people to provide a quality environment, to ensure attractive, convenient and satisfying places to live, work and play.

C. The rights to economic opportunity and freedom of choice in the use of land should remain with the landowner so long as they do not destroy the resource or conflict with a safe, clean and healthy environment for society.

D. Land use policies should be oriented toward protection of the aesthetic values, which are an integral part of our history and way of life.

E. The capability and limitation of soils will be considered in making land use decisions or when increasing the intensity of a land use.

F. Land use policies should consider the impact and influence of the property tax structure. Tax structures should encourage agriculture, wildlife, recreation and similar uses of land in the public interest.

G. To develop and improve the rangeland resource for maximum production, protection of the soil resource and to prevent or reduce sediment pollution of water.

H. To provide broad direction and coordination in maintaining water quality while attaining maximum beneficial use of the surface and ground water resources.

I. Development which results in unsightly urban sprawl should be discouraged.

J. Should mining occur, construction and similar activities which alter and destroy the surface of the land must be treated and reclaimed for planned future uses.

K. Land use policies and plans need periodic review to determine changes in land resources use which are consistent with environmental and social needs.

"For truly, the earth is the Lord's and the fullness thereof, but the responsibility for its stewardship is vested in man."

SECTION III   INVENTORY

CLIMATE

Except for the relatively flat river bottom of the Powder River Valley itself, which ranges from one to a few miles wide, the surrounding country is hilly, with numerous creeks and coulees. Some of the hills are quite rough, particularly to the southwest, where some peaks near the Wyoming border range from 4,000 to 4,500 ft. above sea level. The Powder River itself runs southwest to northeast, draining the central part of the county. The hilly and rough character of the nearby area contribute somewhat to climatic differences, but those differences are not as large or noticable as in more mountainous parts of Montana farther west.

Powder River area has a modified continental climate that is cold in winter, warm in summer, and has large variations in seasonal precipitation. Because of our agricultural background the average length of the growing season is important. The weather station at Broadus records an average of 100 to 128 days when the temperature is above 32. In a normal year, about three-fourths of the annual precipitation falls during the growing season from April to September. Summer precipitation almost always occurs as showers, but late spring sometimes will produce general rains of several hours in duration, and late September or October in some years can have a rainstorm of similar general character. June is the month of most frequent occurrence of general rain. Earlier in the spring or later in the fall this type of storm, starting as a cold rain, may change to wet snow; it is this combination that gives the area some weather problems in an occasional year, perhaps with a frequency of about one to two times in ten years. Thunderstorms are fairly common in the general area, probably occuring about 20 to 30 days a year.

Summers are characterized by warm weather during the day, but most nights even during midsummer, cool down to 60 or even a little less, so really oppressive hot spells are not very common.

The area generally has winters during which snow does not prevent access of livestock to grazing areas. An occasional cold wave will generate sub-zero temperatures, but these spells seldom last more than two or three days and less than one in three winter days will reach zero at the coldest.

Average monthly and annual precipitation at four weather stations are shown in Table 1. Table 2 gives precipitation probabilities for a 25 year period. Table 3 gives maximum amount of rainfall and how frequently such storms can be expected. Table 4 shows the means and extremes of temperature recorded at four stations and the mean snowfall at three.

Table 1. Monthly and Annual Average Precipitation in Inches at Four Weather Stations

Station	Period	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
Boyes	1950-1961	0.36	0.43	0.57	0.95	2.15	2.74	1.61	1.84	1.08	0.74	0.52	0.36	13.35
Broadus	1937-1961	.50	.46	.80	1.24	2.24	3.11	1.39	1.04	1.05	.88	.67	.43	13.81
Moorhead	1948-1958	.24	.31	.64	.13	2.08	2.75	1.38	1.00	.61	.76	.59	.41	10.90
Sonnette 4n	1951-1961	.23	.37	.41	.97	2.21	2.36	1.32	1.06	.90	.86	.59	.27	11.55

Table 2. Probability of Listed Amount of Monthly Precipitation at Broadus

Month	One Year in 10 will have:		Two Years in 10 will have:	
	Less than-- Inches	More than-- Inches	Less than-- Inches	More than-- Inches
January	0.1	1.2	0.2	0.9
February	.1	.9	.2	.7
March	.3	1.7	.4	1.4
April	.3	2.6	.5	2.2
May	1.0	4.1	1.3	3.1
June	1.4	4.7	1.7	4.4
July	.3	2.5	.8	2.1
August	.1	2.5	.4	1.7
September	.3	2.4	.4	1.9
October	.1	1.9	.2	1.8
November	.2	1.3	.2	1.0
December	.1	.8	.2	.7
Annual	9.4	17.5	11.1	16.8

Month	Three Years in 10 will have:		Four Years in 10 will have:	
	Less than-- Inches	More than-- Inches	Less than-- Inches	More than Inches
January	0.3	0.5	0.4	0.4
February	.3	.6	.4	.5
March	.4	1.0	.5	.8
April	.6	1.7	.7	1.4
May	1.5	2.8	1.6	2.3
June	1.9	3.6	2.5	3.2
July	1.0	1.9	1.1	
August	.6	1.4	.6	
September	.5	1.5	.6	1.1
October	.3	1.2	.5	1.0
November	.3	.9	.5	.8
December	.2	.7	.3	.5
Annual	11.9	16.4	13.0	13.9

Table 3. Estimated Maximum amounts of Rainfall in

Powder River County

For Stated Periods of Duration and the Frequency That These Amounts Accur

Based on data from U.S. Weather Bureau Technical Paper No. 40 (6)

Frequency of once in--

Duration	2 years	5 years	10 years
	Inches	Inches	Inches
30 MIN.	0.6	0.9	1.1
1 HOUR	.8	1.1	1.3
3 HOURS	1.0	1.5	1.7
6 HOURS	1.3	1.7	2.0
12 HOURS	1.5	2.0	2.4
24 HOURS	1.7	2.4	2.8

Duration	25 years	50 years
	Inches	Inches
30 MIN.	1.3	1.5
1 HOUR	1.6	1.9
3 HOURS	2.0	2.5
6 HOURS	2.5	2.9
12 HOURS	2.8	3.3
24 HOURS	3.2	3.7

Table 4. Average Temperatures at Four Stations and Average Snowfall at Three Stations for Stated Periods

Mean Maximum Temperature in F.

Station	Period	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
Boyes	1950-1961	33.3	37.5	42.5	56.2	67.8	77.8	87.2	86.7	74.1	63.3	44.7	38.0	59.1
Broadus	1937-1961	31.9	36.3	43.9	57.8	68.0	75.8	87.1	86.4	74.5	63.4	45.0	37.7	59.0
Moorhead	1948-1958	29.8	40.3	43.1	59.3	69.6	79.2	90.4	89.2	79.6	66.9	47.2	36.9	61.0
Sonnette 4n	1951-1961	33.3	37.7	42.8	54.8	67.5	76.9	89.1	87.8	73.6	61.7	44.5	39.0	59.1

Mean Minimum Temperature in F.

Station	Period	Jan.	Feb.	Mar.	Apr.
Boyes	1950-1961	4.8	9.6	16.7	26.7
Broadus	1937-1961	5.8	10.6	19.3	30.9
Moorhead	1948-1958	.6	9.1	15.9	28.6
Sonnette 4n	1951-1961	6.1	11.8	17.5	27.9

		May	June	July	Aug.
Boyes	1950-1961	38.3	47.6	53.7	52.3
Broadus	1937-1961	41.5	49.8	56.0	53.7
Moorhead	1948-1958	40.3	48.7	54.4	52.6
Sonnette 4n	1951=1961	39.6	46.6	54.8	52.9

		Sept.	Oct.	Nov.	Dec.
Boyes	1950-1961	40.4	29.6	16.5	10.7
Broadus	1937-1961	42.6	32.1	19.4	12.2
Moorhead	1948-1958	41.6	30.9	19.2	8.2
Sonnette 4n	1951-1961	39.4	29.6	17.6	13.9

		Annual
Boyes	1950-1961	28.9
Broadus	1937-1961	31.2
Moorhead	1948-1958	29.1
Sonnette 4n	1951-1961	29.8

Mean Monthly Temperature in F.

Station	Period	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
Boyes	1950-1961	19.1	23.6	29.6	41.5	53.1	62.7	70.5	69.5	57.3	46.5	30.6	24.4	44.0
Broadus	1937-1961	18.9	23.5	31.6	44.4	54.8	62.8	71.6	70.1	58.6	47.8	32.2	25.0	45.1
Moorhead	1948-1958	14.6	24.7	29.5	43.9	55.0	64.0	72.4	70.9	60.6	48.9	33.2	22.6	45.1
Sonnette 4n	1951-1961	19.7	24.8	30.2	41.4	53.6	61.8	72.0	70.4	56.5	45.7	31.1	26.5	44.5

Highest Temperature in F.

Station	Period	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
Boyes	1950-1961	69.0	68.0	78.0	87.0	92.0	104.0	105.0	105.0	104.0	92.0	72.0	67.0	105.0
Broadus	1937-1961	61.0	67.0	83.0	90.0	96.0	105.0	108.0	105.0	104.0	92.0	73.0	69.0	108.0
Moorhead	1948-1958	58.0	67.0	76.0	86.0	92.0	102.0	106.0	109.0	101.0	91.0	73.0	65.0	109.0
Sonnette 4n	1951-1961	61.0	68.0	75.0	87.0	92.0	99.0	105.0	103.0	104.0	90.0	70.0	68.0	105.0

Lowest Temperature in F.

Station	Period	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
Boyes	1950-1961	-40.0	-29.0	-38.0	1.0	18.0	26.0	37.0	34.0	13.0	4.0	-30.0	-32.0	-40.0
Broadus	1937-1961	-38.0	-43.0	-27.0	4.0	12.0	31.0	38.0	36.0	17.0	8.0	-28.0	-31.0	-42.0
Moorhead	1948-1958	-42.0	-35.0	-22.0	7.0	12.0	30.0	39.0	36.0	21.0	10.0	-24.0	-31.0	-42.0
Sonnette 4n	1951-1961	-42.0	-35.0	-12.0	-7.0	12.0	30.0	39.0	21.0	10.0	-27.0	-38.0	-38.0	-42.0

Mean Snowfall in Inches

Station	Period	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
Broadus	1937-1961	5.9	5.4	6.3	2.9	.5	.1	0	0	(1/)	1.8	5.0	4.6	32.5
Moorhead	1948-1958	6.6	5.2	10.1	2.5	(1/)	(1/)	0	0	(1/)	2.7	3.5	4.6	35.2
Volborg	1951-1961	4.6	7.0	2.3	2.4	(1/)	(1/)	0	0	0	3.3	5.3	3.6	28.5

1/ Traces (less than 0.5 inch).

GEOLOGY

The geological history of Powder River County includes long periods of sedimentation and erosion. Geologically, the county is on the western edge of the Black Hills uplift and the eastern edge of the Powder River Basin. The occurrence, movement, and quality of ground water in the county is closely related to geological conditions. Formations of importance to the county's ground-water resources are the Lance Formation of Cretaceous age (65 to 135 million years old), the Fort Union Formation of Tertiary age (one to 65 million years old). and the terrace alluvial deposits of Quaternary age (less than one million years old).

The Fox Hills member occurs as a basal member of the Lance formation. The Fox Hills usually consists of layers of thick stanstone and sandy shale. In Powder River County there are good aquifers in overlying formations; consequently, the Fox Hills is of less importance. The thickness of the Fox Hills in the area is approximately 80 feet.

Overlying the Fox Hills member is the Hell Creek member. The Hell Creek consists of about six hundred feet of sandstone and shale with some thin coal seams. Sandstone layers will yield water to wells, with the lower part of the Hell Creek reported to have higher artesian heads and better yields than the upper part. The contacts of the Hell Creek with the underlying Fox Hills member and the overlying Fort Union member are not distinct. Sandstone layers within the Hell Creek are discontinuous and cannot be traced over long distances. Ground water is present in the Hell Creek in amounts adequate for stock and domestic purposes and is of fair to poor quality. In the Powder and Little Powder River valleys, artesian wells, many of which flow, are common.

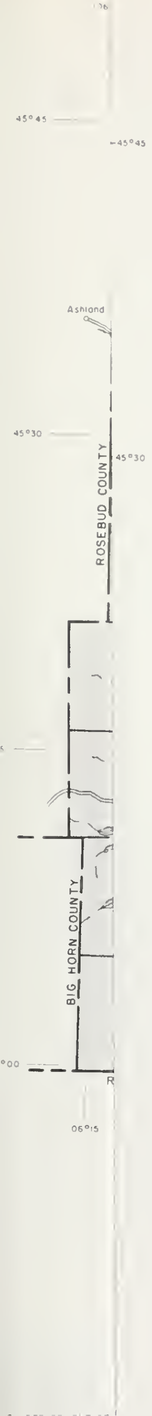
Overlying the Hell Creek is the Fort Union Formation, which consists of the Tongue River Member and the Lebo Shale Member. The Lebo Shale consists of dark grey gumbo shales with impure sandstones. The Lebo shale member ranges from 150-200 feet in thickness. Water yields are low and of poor quality.

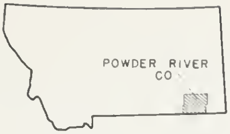
The Tongue River Member of the Fort Union Formation is exposed primarily to the West of the Powder River. This member consists of beds of sandstones and grey shales with many coal seams. Due to erosion, the Tongue River becomes thinner along the Powder River and thickens to west and south. Sandstone and coal beds in the Tongue River supply water to numerous wells in the County. Wells are usually two hundred to fiver hundred feet deep and yield four to twenty-five gallons per minute. The Tongue River is probably the most widely used source of domestic and stock water in the county.

Along the Powder and Little Powder Rivers and their tributaries and other major streams there are deposits of Quaternary alluvium, and in some areas stream terrace deposits. Stream terraces are composed of sand, and gravel and the thicker terraces may contain sufficient ground water for stock and domestic use.

Alluvial deposits along the Powder and Little Powder Rivers consist primarily of sand and silt. Wells in this alluvium yield water, but there have been numerous problems with sand flowing into the wells. Quality of the water is fair to poor. Where the stream valleys are underlain by shale, the water tends to be poorer in quality than where bedrock is sandstone. Ground water also is present in the alluvium of practically all other large streams in the county.

In summary, sandstone layers in the Hell Creek and Fort Union Members, and to a lesser extent alluvium along streams are the most important sources of domestic and stock water in Powder River County. There will be continued development of ground water for livestock and to a lesser extent for domestic purposes. There may be some additional development for municipal purposes, but there are few areas in which water could be developed for irrigation.





LOCATION MAP

GENERAL GEOLOGY

			STRATIGRAPHIC UNITS	HYDROLOGIC CHARACTERISTICS
QUATERNARY	Recent	Qal	Alluvium - Stream deposited valley fill material, generally non-cemented, consisting of boulders, gravels, sand, silt, and clay materials. 10-50 feet in thickness.	Water yields of 10-50 gpm reported.
TERTIARY		Tfut	Tongue River Member of the Fort Union Formation - Buff to yellowish sandstones and grey shales, with many coal seams. Much clinker developed locally. Over 200 feet thick.	Widely utilized aquifer. Yields of 4-25 gpm reported.
		Tful	Lebo Shale Member of the Fort Union Formation - Dominantly dark grey gumbo shales with impure sandstones. Commonly forms bad lands. 150-200 feet in thickness.	Low volume, poor quality water. Not considered suitable for stockwater or domestic water supply.
MESOZOIC	Upper Cretaceous	Kl	Hell Creek Member of the Lance Formation - Predominantly shale with thin stratifications of tan to yellowish-grey sandstones and shales. 600 feet in thickness. Basal unit is the Fox Hills Member, 80 feet thick	Utilized for stockwater - water mineralized. Yields of 3-10 gpm reported. Basal Hell Creek Sandstone is an artesian aquifer - utilized for domestic and livestock supply. Yields of 15-100 gpm reported.

● Flowing water wells - generalized location

Source: Mesozoic and Tertiary geology, and waterwell information taken from Memoir No. 14, Montana Bureau of Mines and Geology, 1935. Ground water yields based on wells put in under Great Plains Conservation Program.

GEOLOGY
POWDER RIVER COUNTY, MONTANA

FEBRUARY 1975

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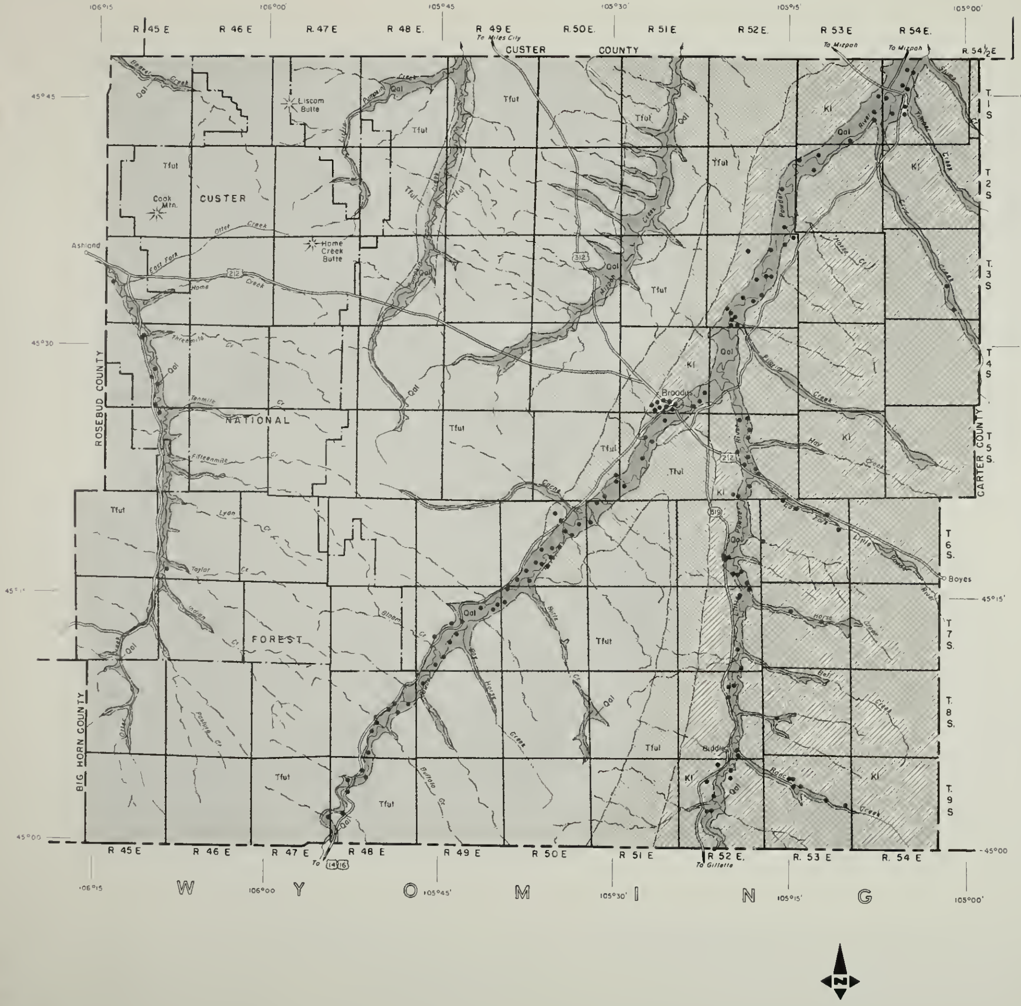

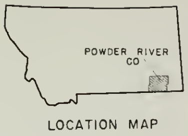

LOCATION MAP

GENERAL GEOLOGY

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GEOLOGY
POWDER RIVER COUNTY, MONTANA

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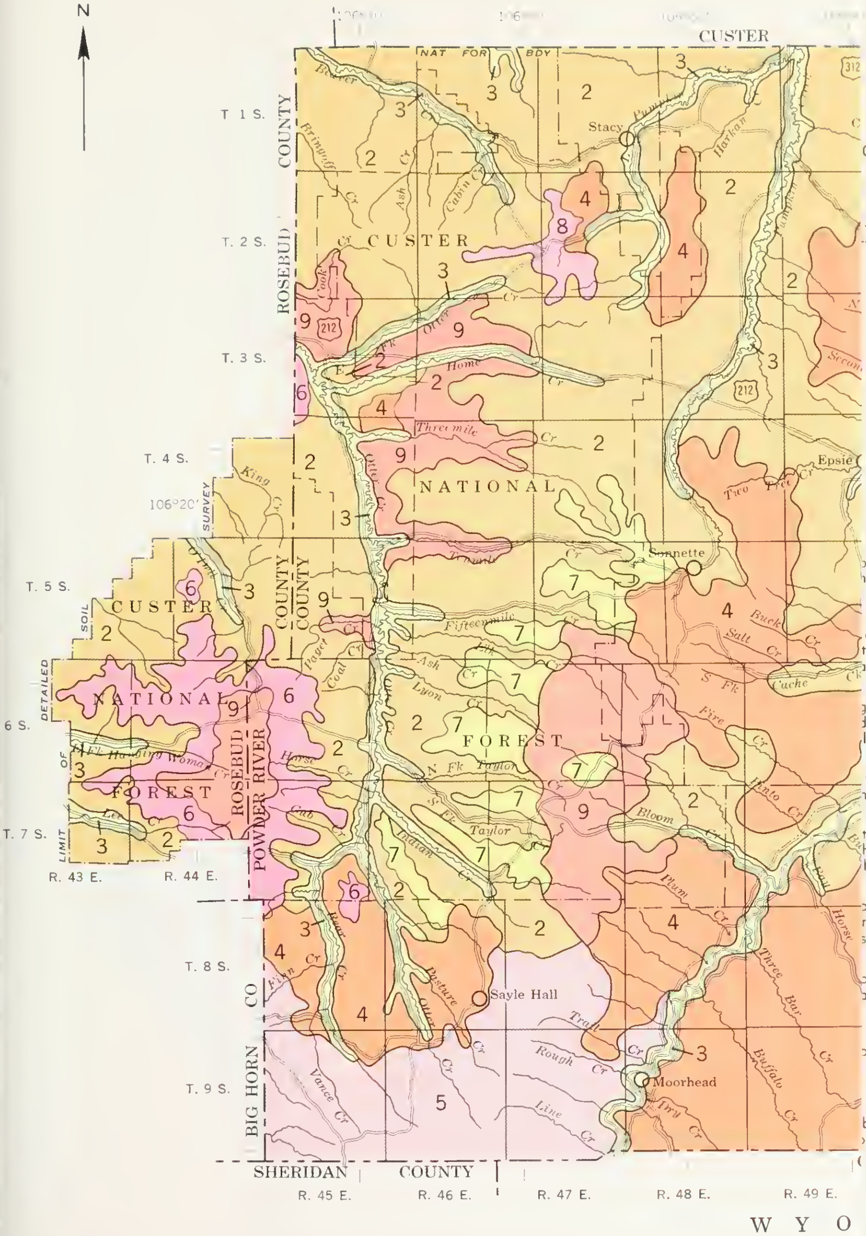
U S DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE



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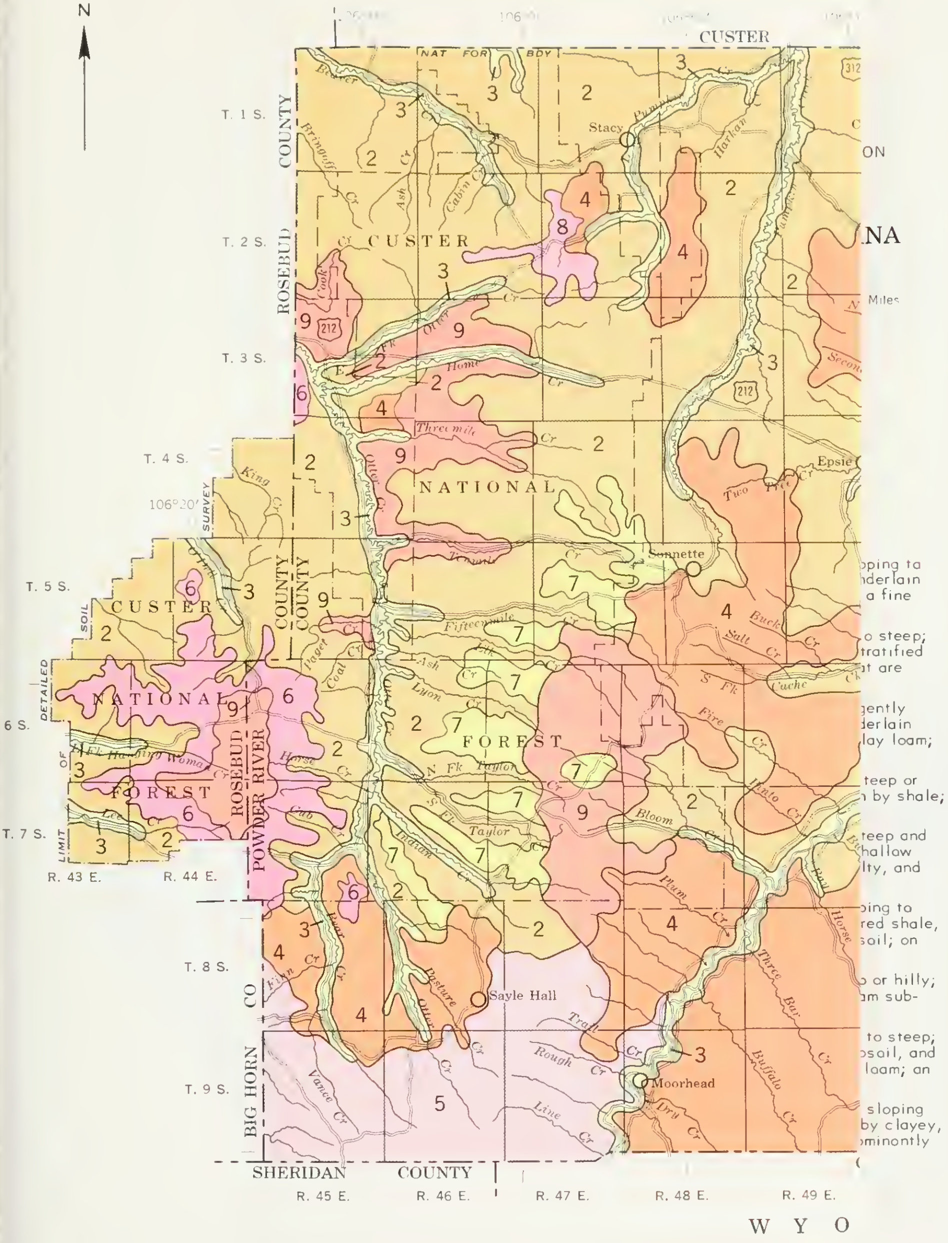

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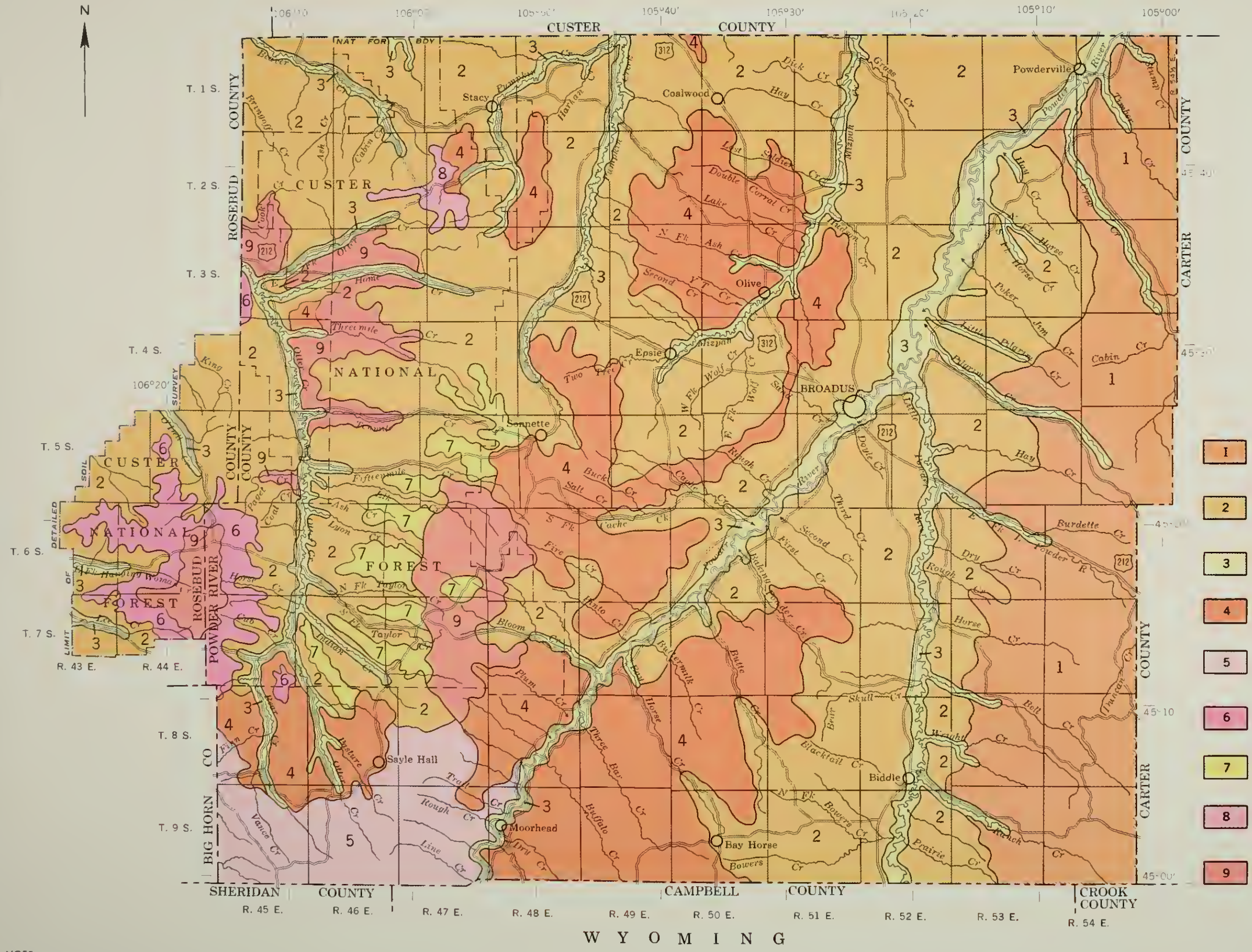


U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
U. S. FOREST SERVICE
U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
MONTANA AGRICULTURAL EXPERIMENT STATION

GENERAL SOIL MAP
POWDER RIVER AREA, MONTANA

Scale 1:443,520
4 0 4 8 12 Miles

SOIL ASSOCIATIONS

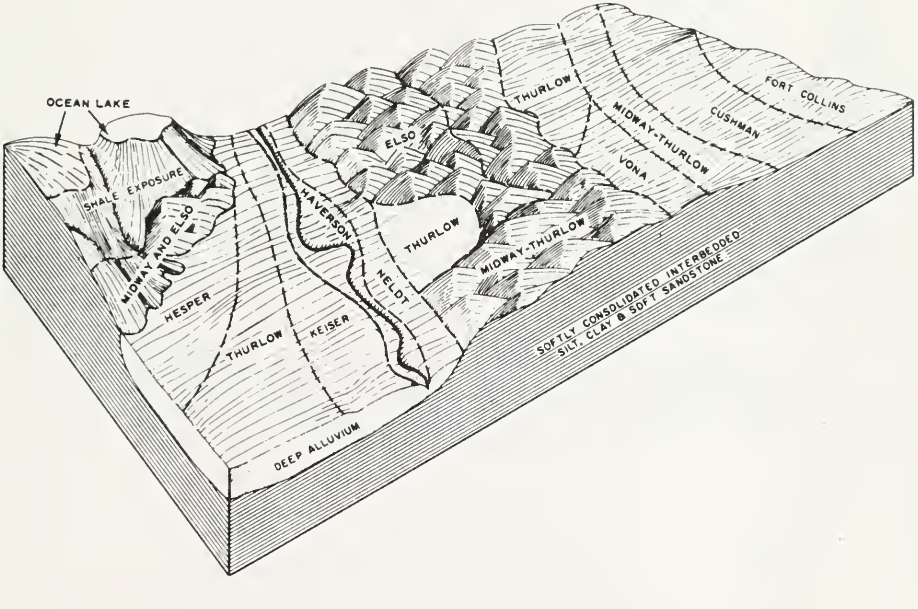
1	Elso-Remmit-Ocean Lake association: Gently sloping to steep; shallow silt loams and fine sandy loams underlain by shale and sandstone, and deep soils that have a fine sandy loam subsoil; on uplands
2	Elso-Midway-Thurlow association: Nearly level to steep; silt loams and clay loams that are shallow over stratified sandy, silty, and clayey shale, and deep soils that are dominantly silty clay loam throughout; on uplands
3	Haverson-Glenberg association: Nearly level to gently sloping; deep silt loams and fine sandy loams underlain dominantly by strata of fine sandy loam to silty clay loam; mainly on flood plains, terraces, and fans
4	Ringling-Cabba-Midway association: Sloping to steep or hilly; shallow slaty loams to clay loams underlain by shale; on uplands
5	Kyle-Midway-Cabba association Undulating to steep and hilly; deep soils that are clayey throughout and shallow clay loams and silt loams underlain by clayey, silty, and sandy shale; on uplands
6	Ringling-Fergus-Relan association. Strongly sloping to steep; shallow soils that are underlain by weathered shale, and deep soils that have a clay loam to loam subsoil; on uplands, fans, and foot slopes
7	Farland-Cabba association Nearly level to steep or hilly; deep soils that have a silty clay loam and silt loam subsoil, and shallow silt loams; on uplands
8	Campspass-Barvon association Strongly sloping to steep; deep soils that have a loam to silty clay loam subsoil, and deep loams that are underlain by dominantly clay loam; on uplands
9	Midway-Thurlow association. Rolling to strongly sloping and steep; shallow clay loams that are underlain by clayey, silty, and sandy shale, and deep soils that are dominantly silty clay loam throughout; on uplands

September 1970

NOTE—
This map is intended for general planning. Each delineation may contain soils having ratings different from those shown on the map. Use detailed soil maps for operational planning

SOIL ASSOCIATIONS

A soil association is a landscape that has a distinctive proportional pattern of soils. It normally consists of one or more major soils and at least one minor soil, and it is named for the major soils. The soils in one association may occur in another, but in a different pattern. A map showing soil associations is useful to people who want to compare different parts of this area, or who want to know the location of large tracts that are suitable for a certain kind of land use. More detailed information on individual soils can be found in the Powder River County Soil Survey report.



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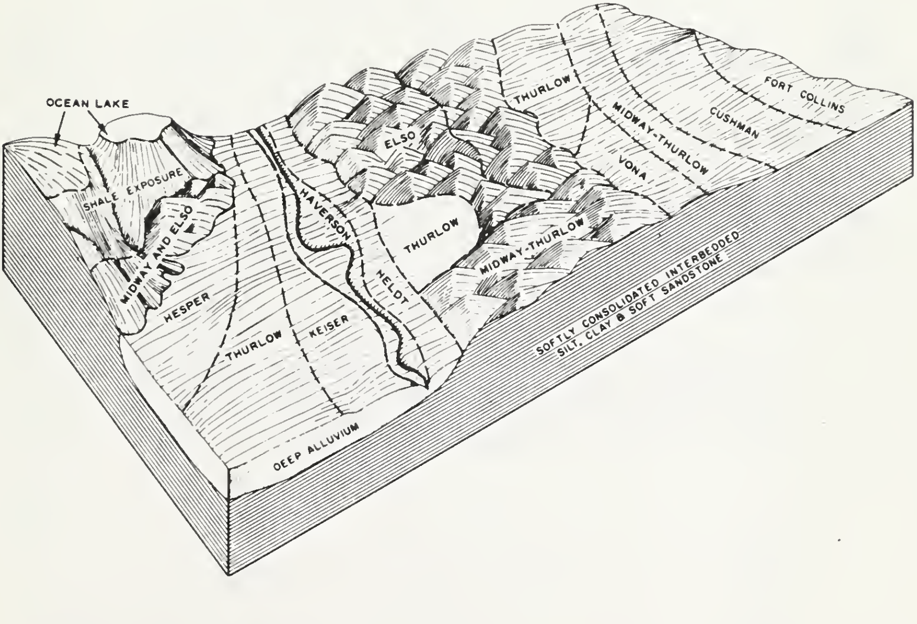


Acreage by Landscape Class & Sub-class 1/
Private and State Owned Land 2/

Land Class & Sub-class	Cropland	Pasture	Range	Woodland	Other	Total	% Class
Class 2C	5663	5841	29,449	0	0	40,953	
2W	360	0	111	0	0	471	
Total 2	6023	5841	29,560	0	0	41,424	3
Class 3C	75,066	6579	105,684	2425	932	190,686	
3E	42,173	14,101	176,898	1000	301	234,473	
3W	0	0	15,272	0	0	15,272	
3S	8,141	0	1,591	0	0	9,732	
Total 3	125,380	20,680	299,445	3425	1,233	450,163	31
Class 4E	10,508	1413	77,129	0	0	89,050	
4S	1,514	0	4,775	0	0	6,289	
Total 4	12,022	1413	81,904	0	0	95,339	6
Class 6E	2,814	1331	607,588	24,500	4377	640,610	
6W	3,581	571	47,865	500	95	52,612	
6S	1.150	164	28,471	1,603	95	31,483	
Total 6	7,545	2066	693,924	26,603	4567	724,705	49
Class 7E	0	0	111,336	52,500	0	163,836	
7S	0	0	0	3,000		3,000	
Total 7	0	0	111,336	55,500	0	166,836	11
Total 8	0	0	12,032	0	0	12,032	1
Grand Total	150,970	30,000	1,218,201	85,528	5,800	1,490,499	

1/ Powder River County Conservation needs inventory 1967
2/ 611,901 acres of Federal, built-up areas & water areas not included.

LAND CAPABILITY CLASSIFICATION

The capability classification is a practical grouping of soils. Soils and climate are considered together as they influence use, management, and the kinds of crops that can be grown.

The classification contains two general divisions: (1) Land suited for cultivation and other uses and (2) Land limited in use and not best suited for cultivation. The hazards and limitations in use increase as the class number increases.

Capability classes are divided into subclasses. These show the principal kinds of problems involved. The subclasses are: "e" for erosion, "w" for wetness, "s" for soil, and "c" for climate, short season or drouthy conditions.

Land Suited for Cultivation and Other Uses

Class 1	Soils in Class 1 have few or no limitations or hazards. They may be used safely for growing a wide variety of cultivated crops, for pasture, range, woodland, and wildlife. There are no Class 1 lands in the district due to climatic limitations.
Class 2	Soils in Class 2 have few limitations or hazards. Simple conservation practices are needed when cultivated. They are suited for cultivated crops, pasture, range, woodland and wildlife.
Class 3	Soils in Class 3 have more limitations and hazards than those in Class 2. They require more difficult or complex conservation practices when cultivated. They are suited for cultivated crops, pasture, range, woodland and wildlife.
Class 4	Soils in Class 4 have greater limitations and hazards than Class 3. Still more difficult or complex measures are needed when cultivated. They are suited for growing cultivated crops, pasture, range, woodland and wildlife.

Land Limited in Use -- Generally not Suited For Cultivation

Class 5	Soils in Class 5 have little or no erosion hazard but have other limitations that prevent normal tillage for cultivated crops. They are suited for pasture, range, woodland and wildlife. There are no Class 5 lands in the district.
Class 6	Soils in Class 6 have severe limitations or hazards that make them unsuited for most cultivation. They are suited generally for pasture, range, woodland and wildlife.
Class 7	Soils in Class 7 have very severe limitations or hazards that make them generally unsuited for cultivation. They are suited for range, woodland and wildlife.
Class 8	Soils and land forms in Class 8 have limitations and hazards that prevent their use for cultivated crops, pasture, range, or woodland. They may be used for recreation, wildlife and water supply.

PHOTO BY TWILA J. TAL TT

LAND OWNERSHIP

The land ownership pattern of the district is shown on the land ownership map. The approximate ownership of this land is as follows:

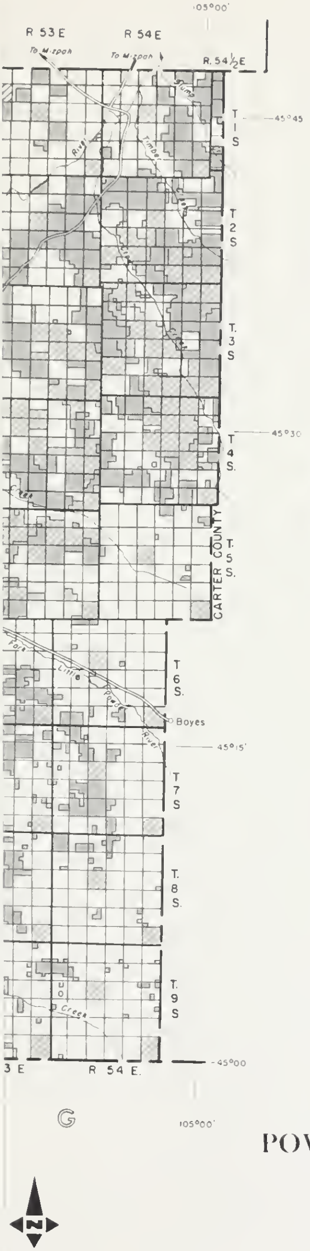
Private	1,361,594
State of Montana	141,420
Forest Service	341,946
Bureau of Land Management	257,440
Total Acres	2,102,400

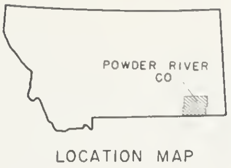
Private ownership accounts for about 65% of the land in the district.

Federal lands (28%) are administered by the Forest Service and BLM. Lands administered by the FS (16%) are located in a block along the Western border of the County. The BLM lands (12%) are mainly found adjacent or to the south and east of the Powder River.

State lands amount to about 7% of the total 2,102,400 acres. These lands are commonly found in Section 16 and 36 of each township. Normally these lands are leased to local operators for 10 year periods.

"Someday this will all be yours, son."





- ▩ Bureau of Land Management
- ▒ State of Montana
- ▨ Burlington Northern R. R.
- ░ Forest Service
- ☐ Private

LAND OWNERSHIP
POWDER RIVER COUNTY, MONTANA

FEBRUARY 1975

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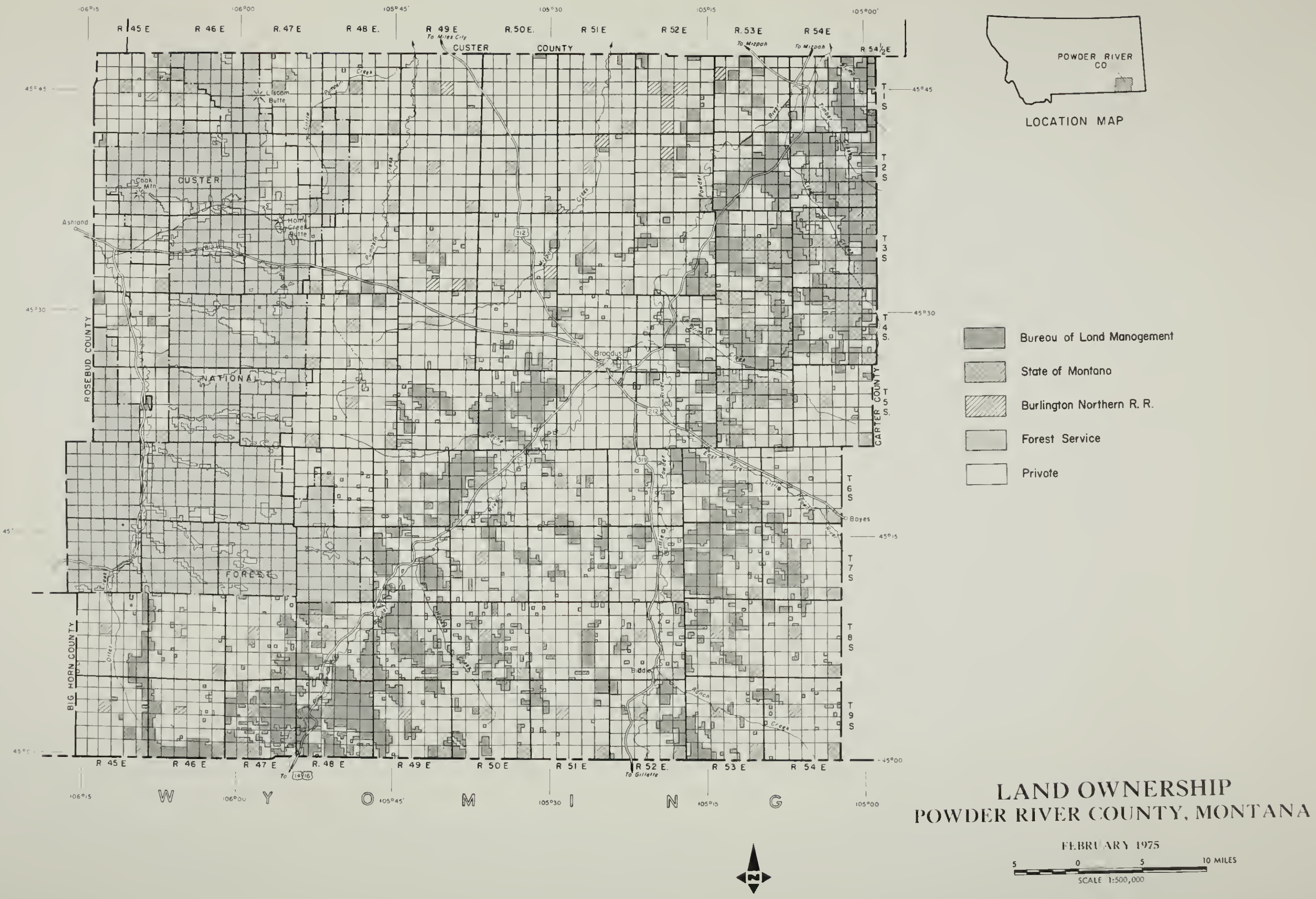

LAND OWNERSHIP
POWDER RIVER COUNTY, MONTANA

FEBRUARY 1975

WATER RESOURCES

The water resources of the District are one of its most important assets. Water is essential for domestic, agricultural, industrial, wildlife, and recreational uses. As demand for these various uses increase, planning for the use and development of water in the district will become an important consideration.

Surface Water

The use of surface water is widespread for agricultural and recreational purposes. Because of the extremes in precipitation, the supply of surface water varies considerably from year to year.

The following is information on three recording stations in the county:

Powder River at Moorhead

The water-stage recorder is 500 feet downstream from the post office at Moorhead and 6¼ miles upstream from Buffalo Creek. The drainage area is approximately 8,030 square miles. Records are available from May 1929 to 1961. Prior to Aug. 28, 1931, a staff gage one quarter of a mile upstream was used at a different datum; from Aug. 28, 1931, to March 21, 1956, a water-stage recorder was used three-quarters of a mile upstream at a different datum; from March 22, to July 24, 1956 a staff gage at site one quarter of a mile downstream was used at different datum, from July 25, 5o Sept. 12, 1956, a staff gage was used at the present site and datum. The maximum discharge computed was 15,300 cfs (May 25, 1952 at gage height of 10.67 ft.) A flood of Sept. 30, 1923 reached a stage of 19 feet at the site from information supplied by local residents. The minimum was no flow at time in 1931-34 and part of July 14, 1954. The average discharge for 30 years was 442 cfs or 320,000 acre-feet per year. The highest annual runoff was 629,800 acre-feet (1944) and the lowest 137,600 acre-feet (1954). There are three reservoirs in Wyoming with combined usuable capacity of 36,800 acre-feet.

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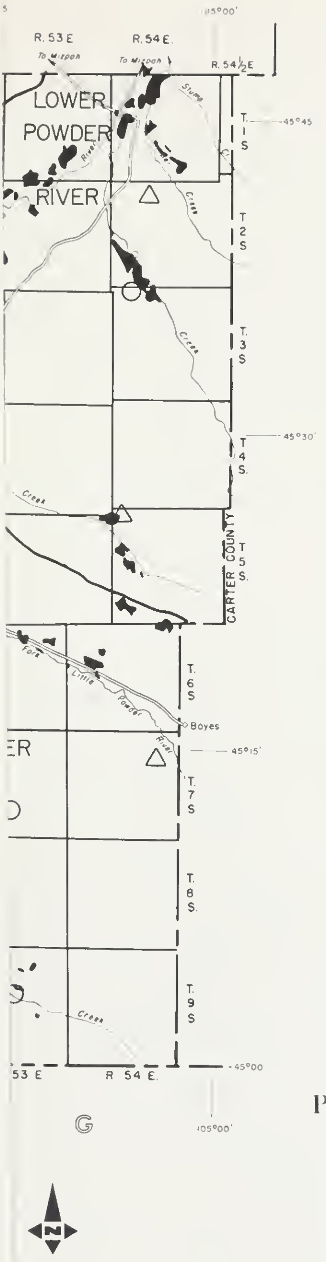
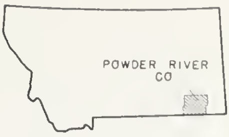
Little Powder River at Biddle (discontinued)

The wire-weight gage was at highway bridge half a mile downstream from Ranch Creek and three quarters of a mile northeast of Biddle. The drainage area is approximately 1,540 square miles. Records are available from April 1938 to June, 1943. The maximum discharge was 5,700 cfs (Aug. 17, 1940) and the minimum, no flow at times. The highest annual runoff during the four complete years of record was 21,890 acre-feet (1939) and the lowest 14,810 acre-feet (1942). The mean discharge for 1939 was 30.2 cfs and for 1942 was 20.5 cfs. There are small diversion for irrigation above the station.

Little Powder River near Broadus

The water stage recorder is a quarter of a mile downstream from mouth of East Fork of Little Powder River, 1 mile downstream from highway bridge, 5½ miles upstream from mouth, and 5½ miles southeast of Broadus. The drainage area is about 1,990 square miles. Records are available from May 1947 to Sept. 1953 and March 1957 to date. The maximum discharge was 2,340 cfs (June 15, 1953) and the minimum, no flow at times. The average discharge for 8 years 1948-53, 1958-58 was 33.3 cfs or 24,110 acre-feet per year. The highest annual runoff was 46,880 acre-feet (1949) and the lowest 10,140 acre-feet (1958). There are small diversions for irrigation of hay meadows above the station.





LOCATION MAP

LEGEND

△ Reservoirs-Over 50 A.F Storage

○ Potential Reservoir Sites

× Stream Gaging Stations

● Existing Waterspreading Systems

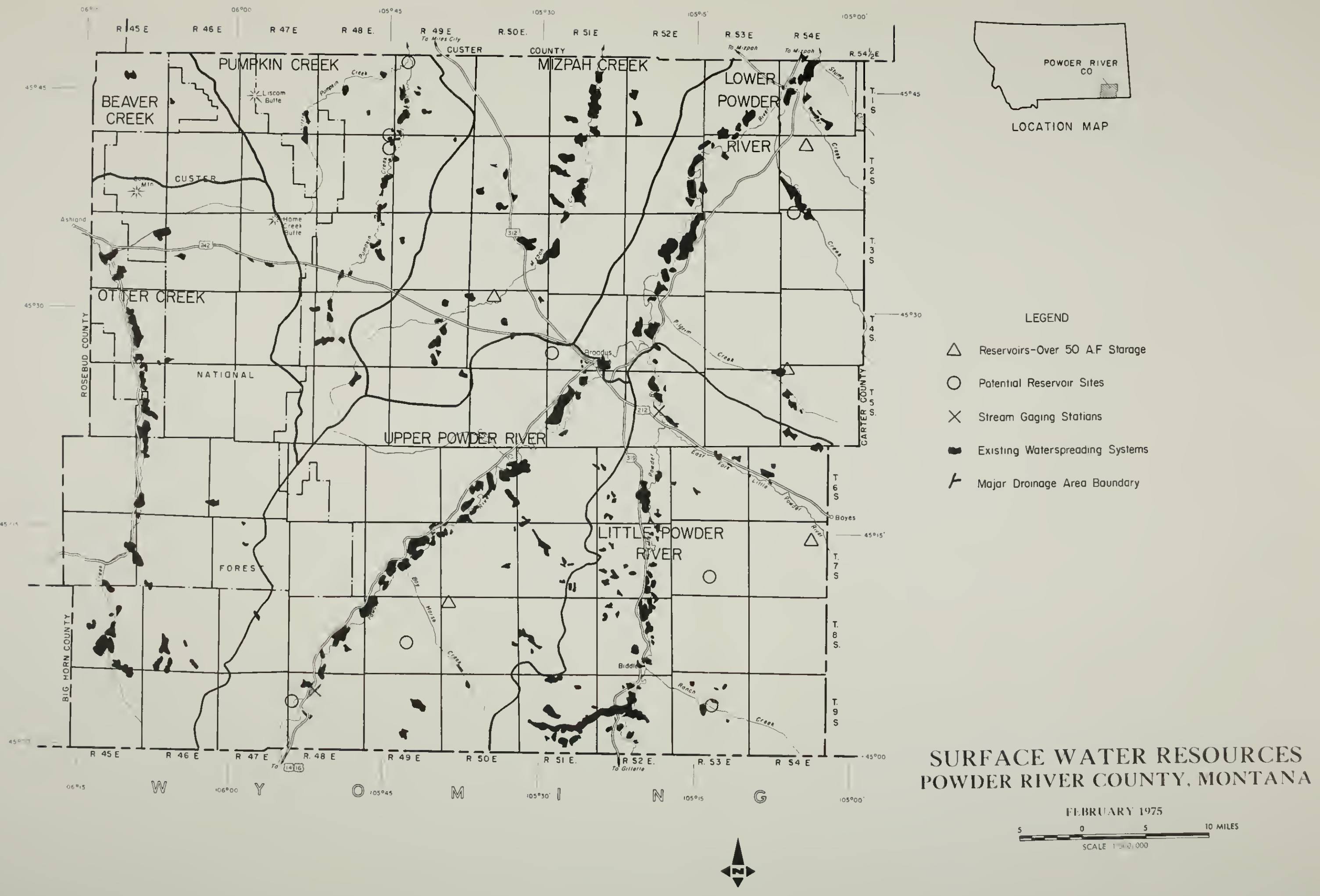
Major Drainage Area Boundary

SURFACE WATER RESOURCES
POWDER RIVER COUNTY, MONTANA

FEBRUARY 1975

5 0 5 10 MILES

SCALE 1:500,000



SURFACE WATER RESOURCES
POWDER RIVER COUNTY, MONTANA

FEBRUARY 1975

Drainage	Area	% of Powder River County
Beaver Creek	76,959 acres	3%
Pumpkin Creek	202,453 acres	10%
Mizpah Creek	271,289 acres	13%
Lower Powder	307,921 acres	15%
Otter Creek	405,061 acres	19%
Upper Powder	470,016 acres	22%
Little Powder	368,701 acres	18%
	2,102,400 acres	100%

Drainage	Runoff yield from snow melt	Developed Acres
Beaver Creek	3,207 acre feet	101 acres
Pumpkin Creek	8,436 acre feet	2,091 acres
Mizpah Creek	11,304 acre feet	5,412 acres
Lower Powder	12,830 acre feet	6,464 acres
Otter Creek	16,879 acre feet	4,124 acres
Upper Powder	19,584 acre feet	8,898 acres
Little Powder	15,362 acre feet	6,864 acres
	87,602 acre feet	33,954 acres

Note: Acre feet was derived by multiplying .5 average annual snow melt by drainage size.

Example: $76,959 \times .5 = \frac{38,480}{12} = 3,207$ acre feet

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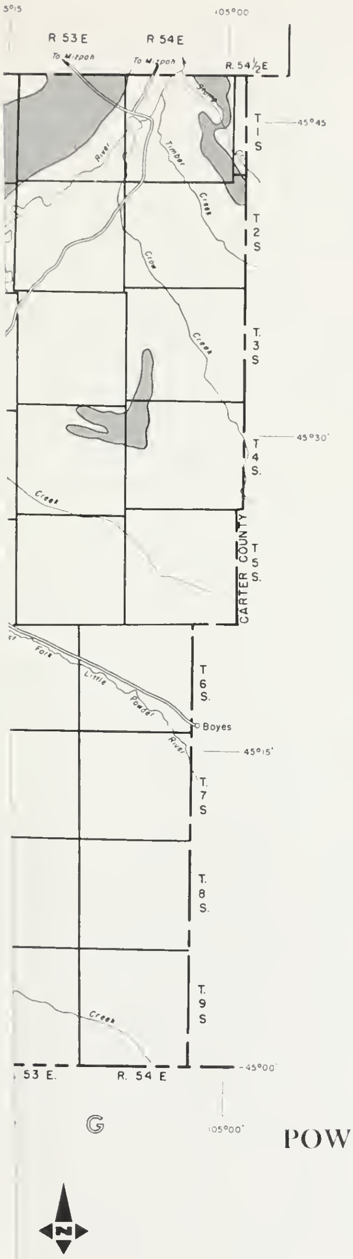
SEVERE EROSION HAZARD AREAS

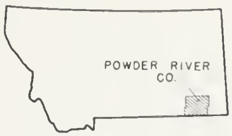
Soil erosion in the District occurs in a pattern similar to that of other areas in Eastern Montana. Because soils vary significantly in their susceptibility to erosion, those areas with severe erosion hazards have been delineated. These delineations are based on soil characteristics such as slope, permeability, surface texture and plant cover.

Soils with severe water erosion hazards are the steep to very steep shallow soils including some areas of exposed sandstone and shale. Run-off from these areas is very rapid. Approximately 20 per cent of the soils in the district are included in the grouping. Since these areas are used primarily for grazing, intensive management of the grass cover is essential to minimize erosion. Parts of these areas are subject to some natural geologic erosion.

Although not shown on the map, streambank and gully erosion do occur along many of the major drainageways throughout the District.

Wind erosion is found in all parts of the County. The primary areas follow the land use by cultivation. Soil types and conservation methods greatly affect the severity of this erosion.





LOCATION MAP

LEGEND

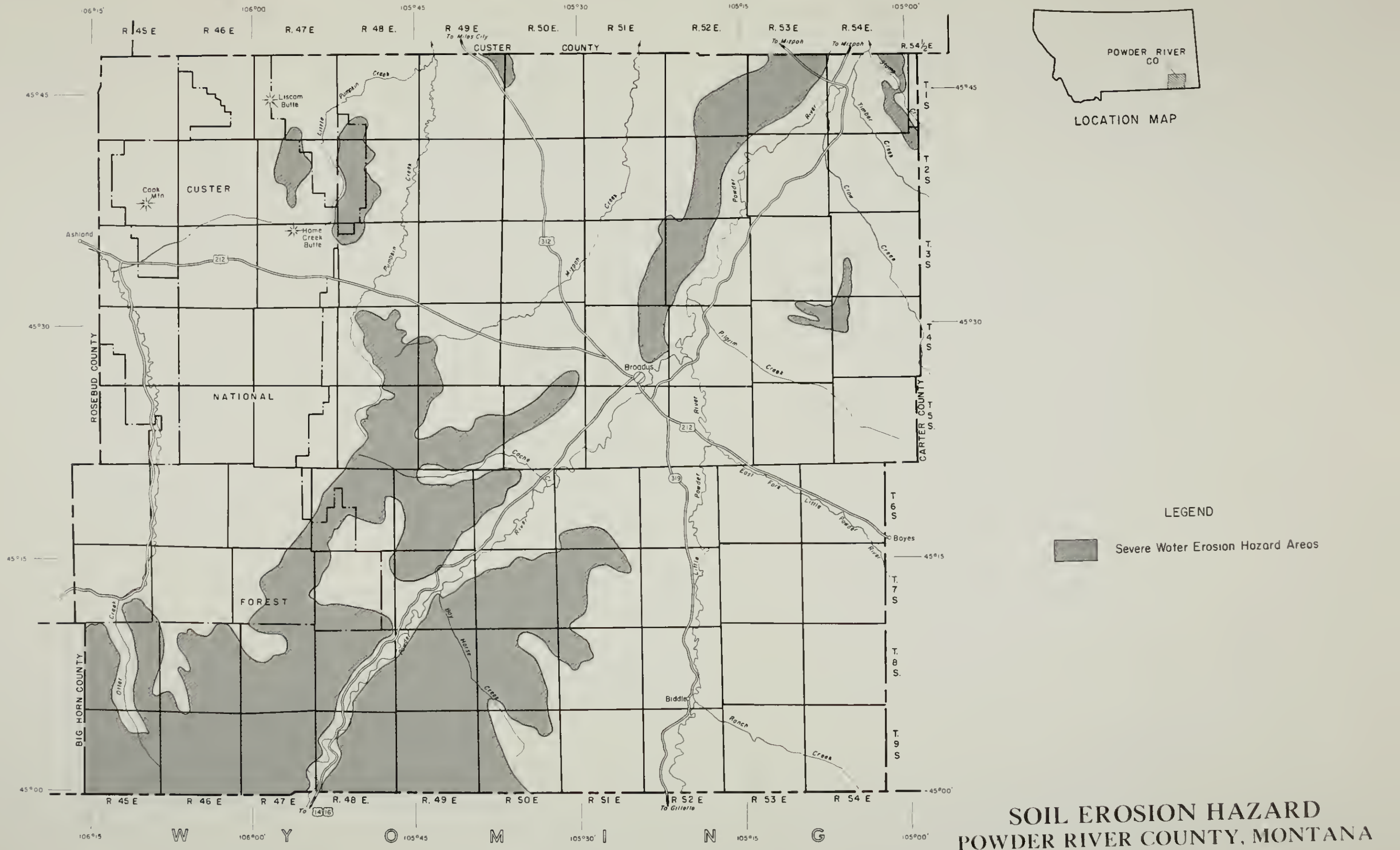
▨ Severe Water Erosion Hazard Areas

SOIL EROSION HAZARD
POWDER RIVER COUNTY, MONTANA

FEBRUARY 1975

5 0 5 10 MILES

SCALE 1:500,000



SOIL EROSION HAZARD
POWDER RIVER COUNTY, MONTANA

FEBRUARY 1975

5 0 5 10 MILES
SCALE 1:500,000

FISH & WILDLIFE RESOURCE

Powder River County supports huntable populations of mule deer, whitetailed deer, antelope, pheasants, turkeys, sharp-tailed grouse, sage grouse, and Hungarian partridge. Waterfowl hunting is limited to a few stock ponds and streams before freeze up. Fishing is just about entirely limited to man-made reservoirs which are stocked annually by the Fish and Game Department.

Mule deer occur throughout the county and in many places are so numerous that they cause damage to haystacks. The entire county has been open for two deer either sex seasons for many years. The excellent deer habitat (rough terrain and brushy draws) coupled with mild winters and a high reproductive rate has produced a deer herd larger than in any other part of the state. Harvest figures for 1972 show that about 12,000 deer were harvested in the seven hunting districts which encompass Powder River County. This was about 12 per cent of the total deer harvest for Montana in 1972.

White-tailed deer are found along the Powder River and some of the larger streams in the county. Because of the type of habitat (dense brush along streams) that they frequent they are more difficult to hunt. About 20 per cent of the deer harvested in eastern Montana are whitetails. Approximately 60 per cent of the deer hunters in Powder River County are non-residents which provides a fair boost to the local economy.

Antelope occur throughout the county except on the Custer National Forest. Antelope distribution is closely tied to the distribution of sage brush in the county which is their major food supply in the winter. Approximately 2,300 antelope permits are issued for the seven hunting districts of which Powder River County is a part. Antelope hunters average close to 70 per cent success which results in a harvest of about 1600 antelope.

Bird hunting opportunities are excellent in Powder River County but few hunters spend much time at it. Most bird hunters hunt opening weekend and then spend their time hunting big game. Pheasants occur along some of the major drainages in the county usually closely tied to agricultural lands. Sharp-tailed grouse and Hungarian partridge occur throughout the county and in places are locally abundant. Sage grouse are closely tied to areas supporting sagebrush while turkey can be found throughout the forested regions of the county.

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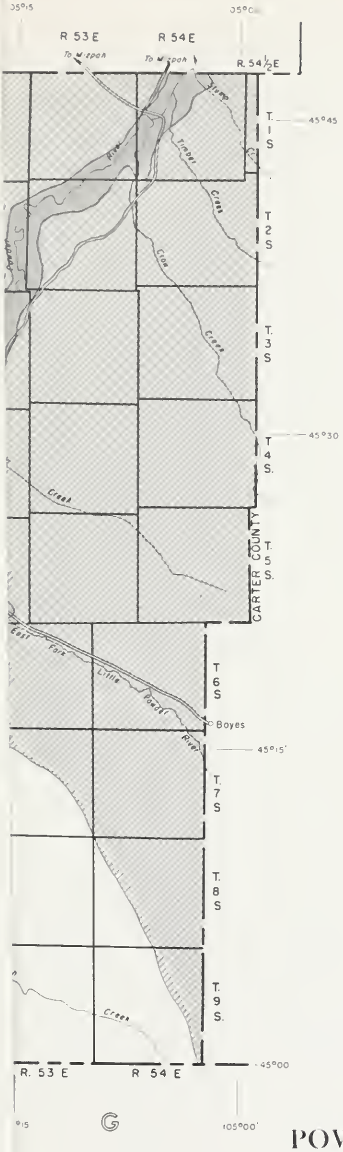
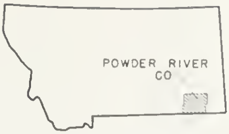
Ten reservoirs in Powder River County are annually stocked with fish by the Fish and Game Department. Burley, Cook, Sanburn, Carter, and McGill (Stump) Reservoirs are stocked with rainbow trout fingerlings (2-4"). Home Creek Butte (Wilbur Creek) and Cow Creek Reservoirs are stocked with catchable (7-9") rainbow trout. LaRoche Reservoir #1 is stocked with largemouth bass while LaRoche Reservoir #2 is stocked with walleye pike. Moores East Buckle Reservoir is stocked with northern pike (3-4").





LOCATION MAP

LEGEND

▨ Ring-Neck Pheasant

▨ Sage Grouse

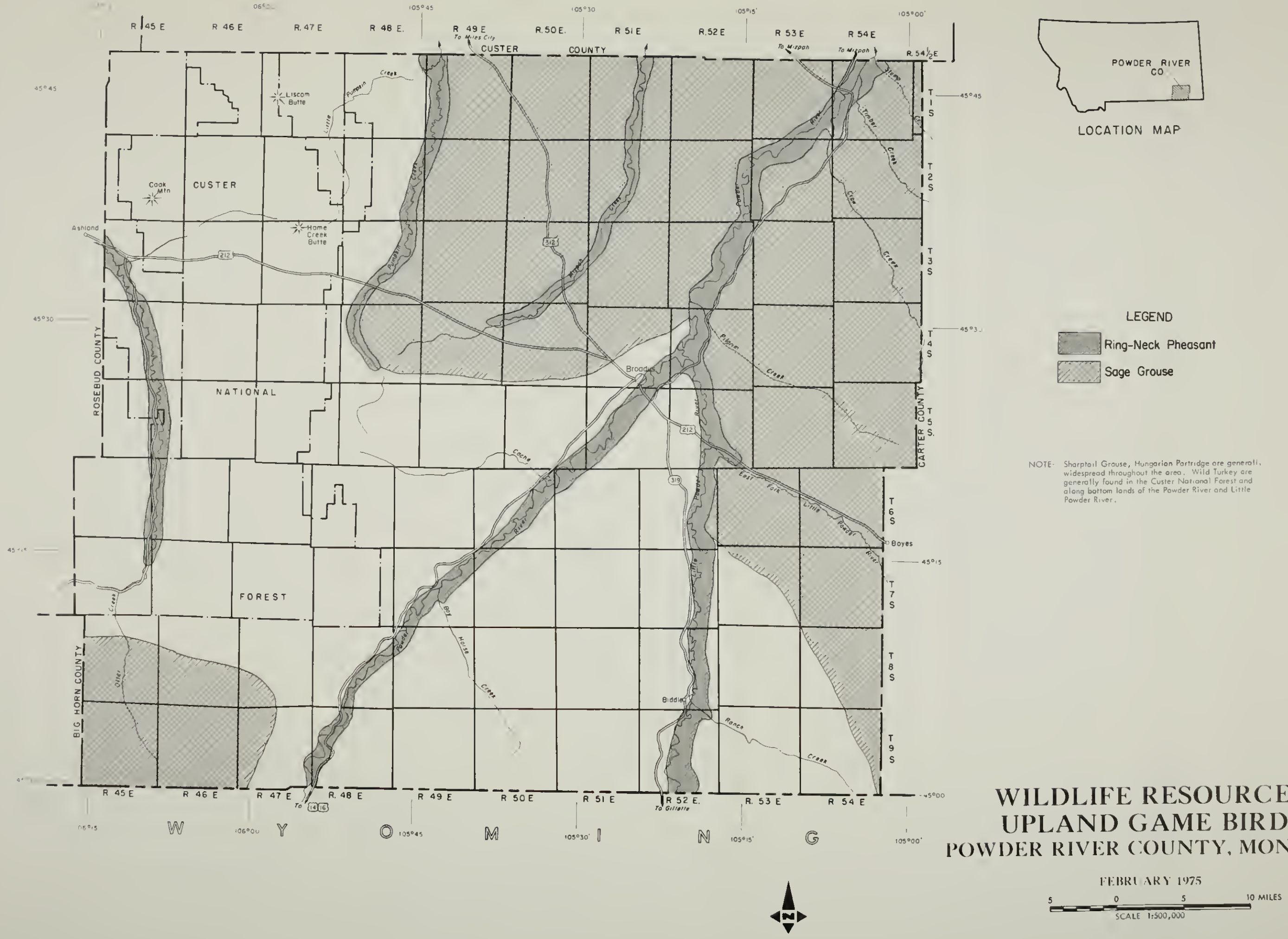
NOTE: Sharptail Grouse, Hungarian Partridge are generally widespread throughout the area. Wild Turkey are generally found in the Custer National Forest and along bottom lands of the Powder River and Little Powder River.

WILDLIFE RESOURCES - UPLAND GAME BIRDS
POWDER RIVER COUNTY, MONTANA

FEBRUARY 1975

5 0 5 10 MILES

SCALE 1:500,000



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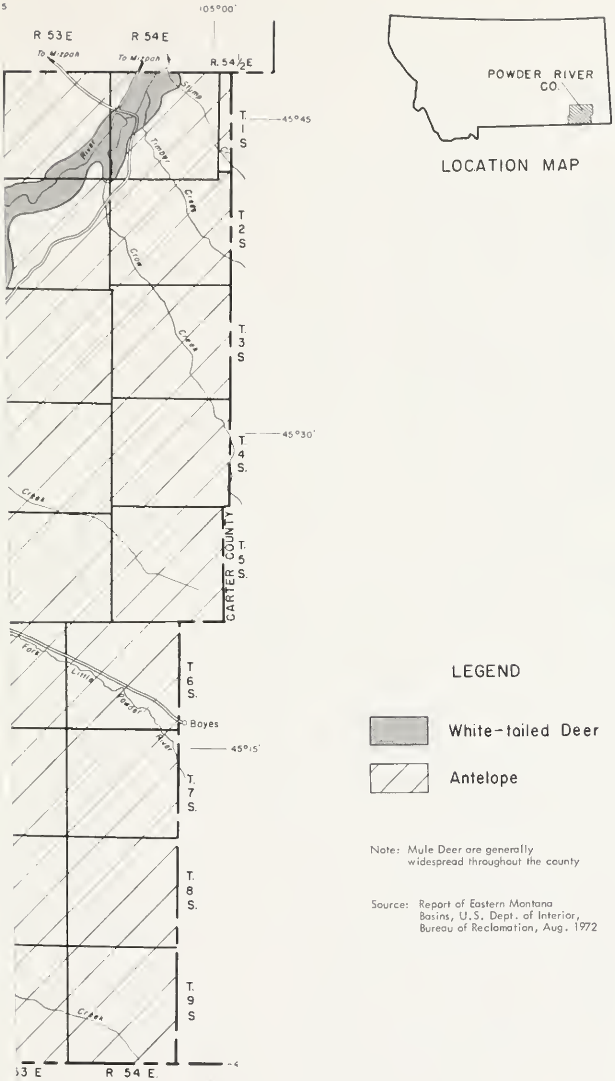
WILDLIFE RESOURCES - UPLAND GAME BIRDS
POWDER RIVER COUNTY, MONTANA

FEBRUARY 1975

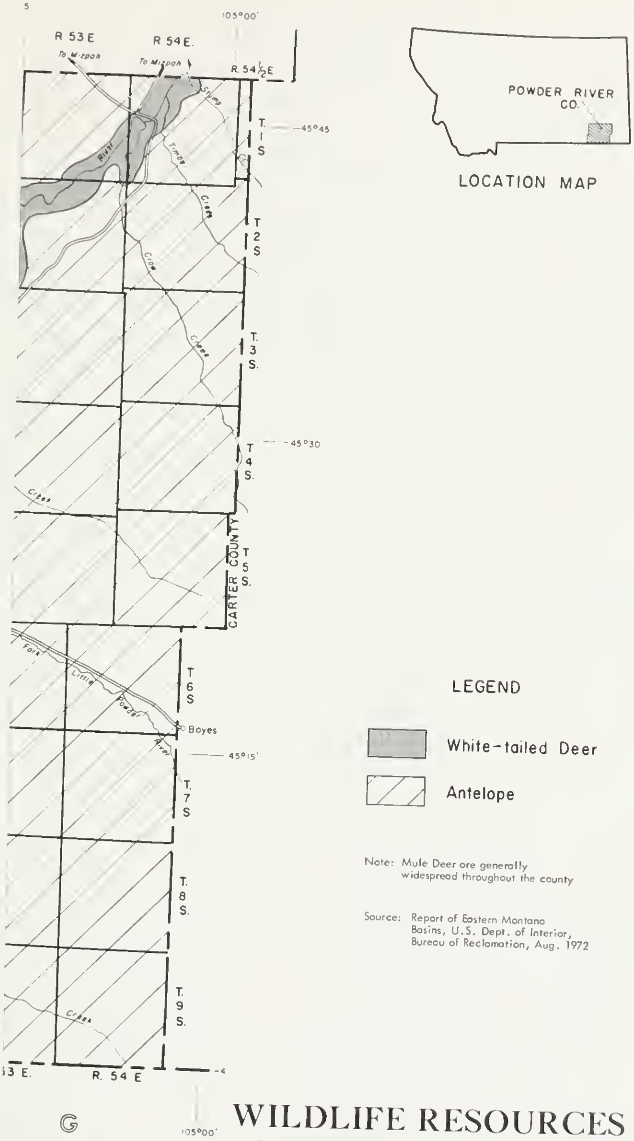


Note: Mule Deer are generally widespread throughout the county

Source: Report of Eastern Montana Basins, U.S. Dept. of Interior, Bureau of Reclamation, Aug. 1972

WILDLIFE RESOURCES - BIG GAME
POWDER RIVER COUNTY, MONTANA

FEBRUARY 1975



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WILDLIFE RESOURCES - BIG GAME
POWDER RIVER COUNTY, MONTANA

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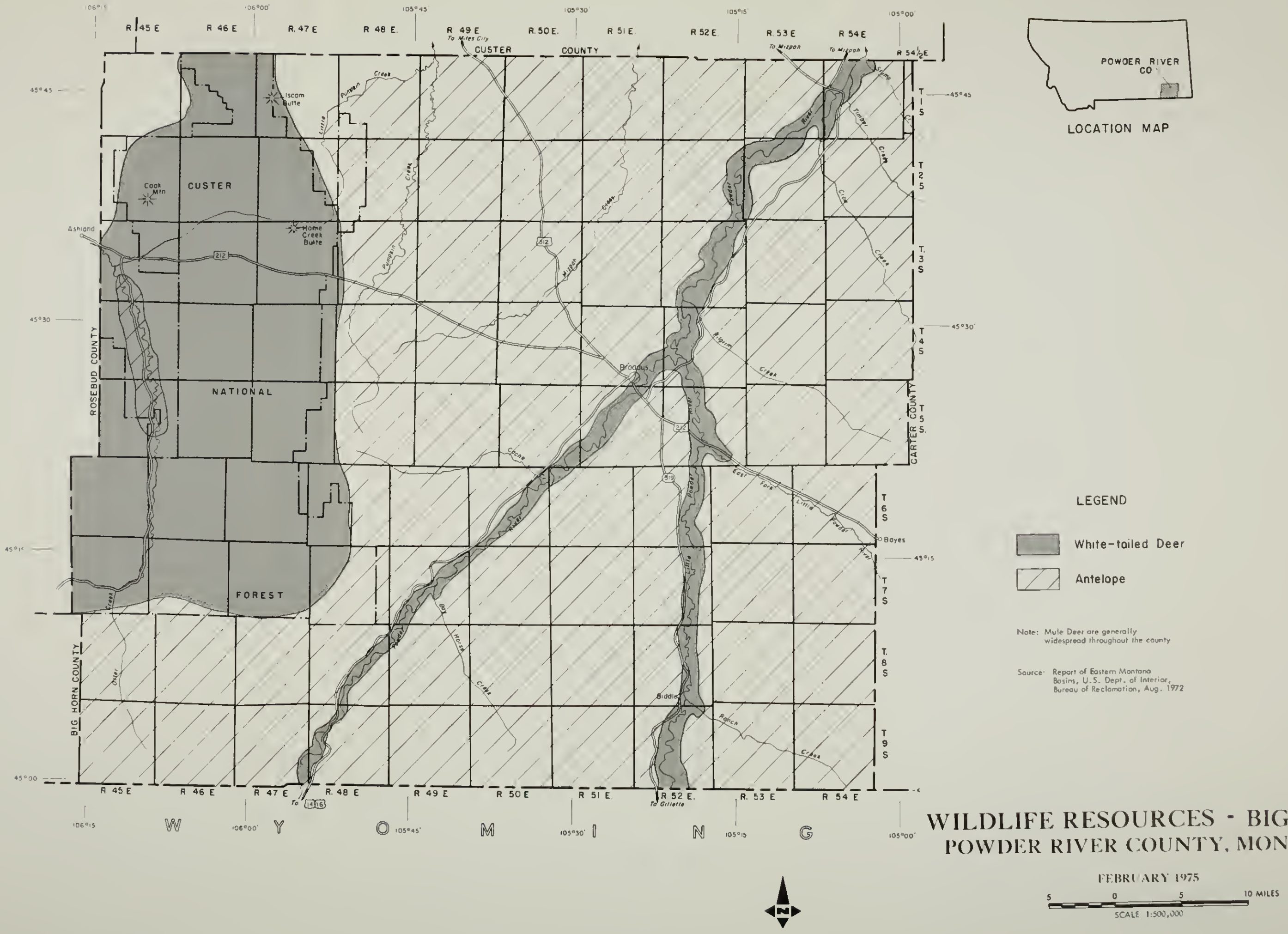

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WILDLIFE RESOURCES - BIG GAME
POWDER RIVER COUNTY, MONTANA

FEBRUARY 1975

MINERAL RESOURCES

The principal mineral resources found in Powder River County include Coal (Sub-bituminous and lignite), Oil, Gas, and Sand and Gravel

Of greatest concern to local people at the present time is the potential of coal development and the impact it may have on the area. Powder River County is underlain by vast reserves of good quality low sulphur coal. It is estimated that production of coal in Powder River County could begin within 3-5 years.

Figures from the Montana Buerau of Mines show an estimated 43.4 billion tons of coal reserves in the county that are within 1000 feet of the surface. This accounts for 19.5% of the Fort Union Coal reserves in Montana. Approximately 15% or 6.6 billion tons are estimated to be strippable. These beds are all located in the western half of the county. The major strippable coal deposits found in the county include:

Deposit Bed	Max. Overburden Thickness in feet	Ave. Bed Thickness
1. Foster Creek		
Knoblock	120	14
1. Moorhead		
Canyon	120	21
Dietz	120	9
Anderson	120	22
1. Otter Creek		
Knoblock	150	40
1. Sandcreek		
Knoblock	120	12
2. Broadus		
Broadus	120	20
2. Sonnette		
Pawnee	150	22
2. Pumpkin Creek		
Sawyer	200	27

1. Sub-bituminous
2. Lignite

Oil and natural gas production in Powder River County boomed in 1967 with the discovery of the Belle Creek field in the southeastern portion of the county. The Belle Creek field is currently on the the largest producing fields in Montana. Production from this field

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1. Sub-bituminous
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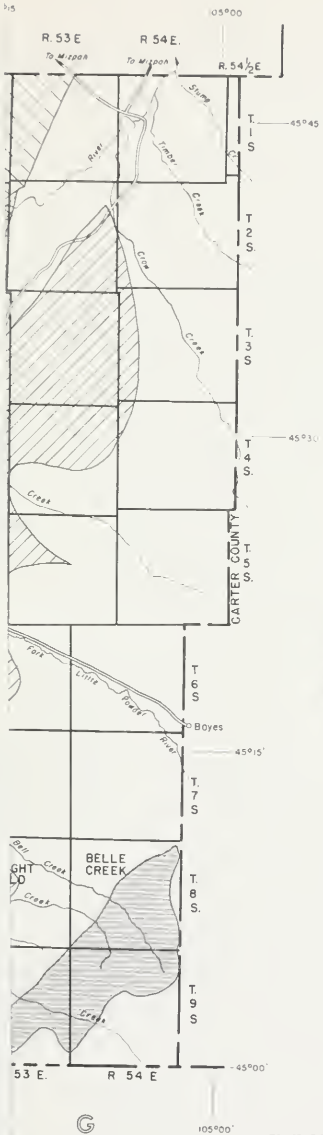
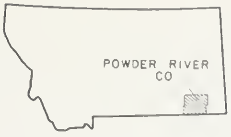
Oil and natural gas production in Powder River County boomed in 1967 with the discovery of the Belle Creek field in the southeastern portion of the county. The Belle Creek field is currently on the the largest producing fields in Montana. Production from this field in 1971 was 5.9 million barrels of oil from over 300 wells. In addition 77,331 barrels were produced in 1971 from the Leary and Wright fields. The estimated oil reserves in the county as of 1/1/76 are 38,643,000 barrels.

In addition to oil, natural gas production in the county during 1971 totaled 2.7 million cubic feet from the Belle Creek and associated fields. A small gas field in the northern part of the county, Pumpkin Creek, is being developed for use by Montana-Dakota Utilities.

Sand and gravel resources in the county are quite limited, occurring mostly along the major stream and in the Pumpkin Creek area. The sands and gravels found in the county are of only poor to fair quality because of the high silt content. There are no commercial sand and gravel operations in the county.





LOCATION MAP

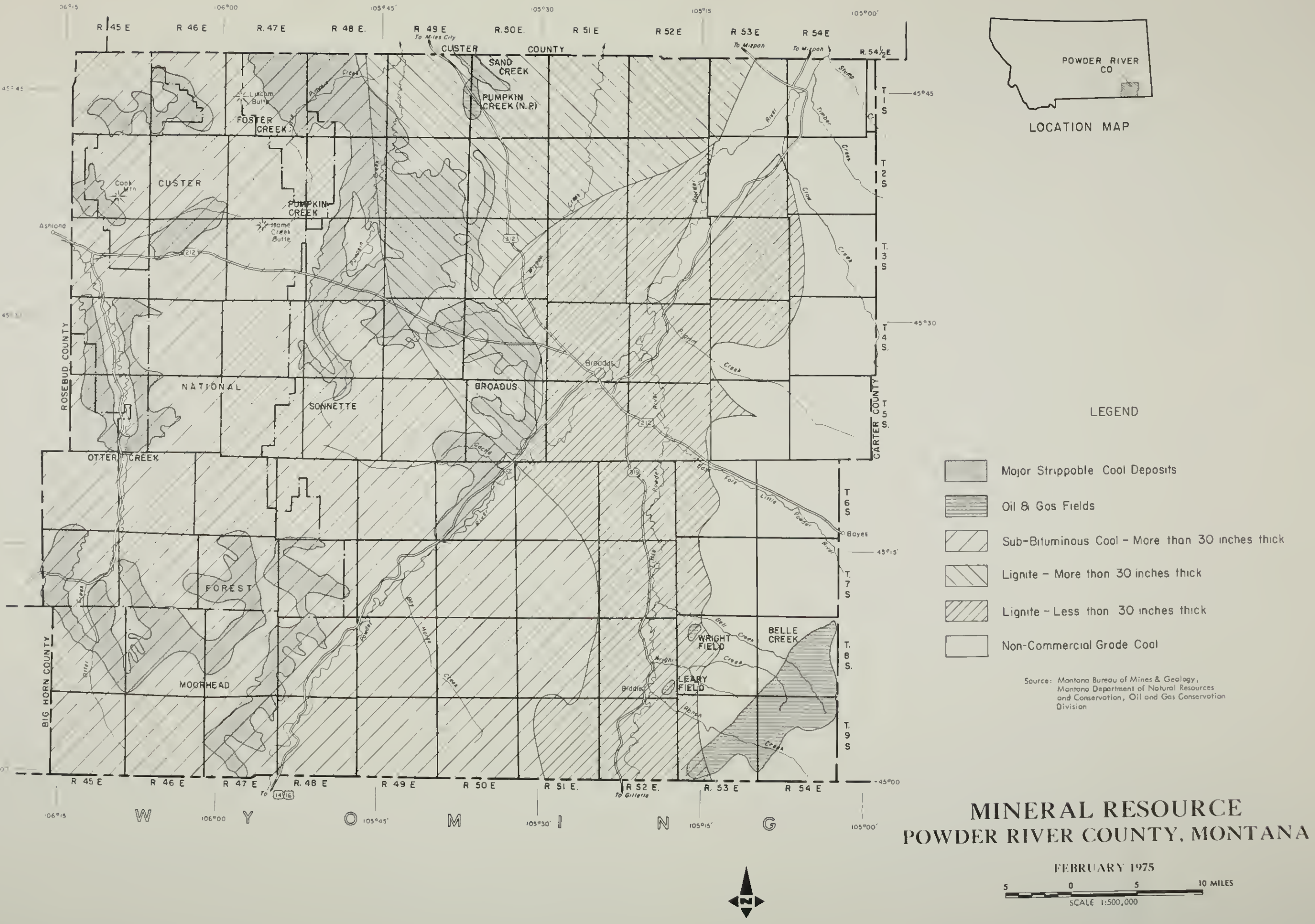
LEGEND

░	Major Strippable Coal Deposits
▤	Oil & Gas Fields
▨	Sub-Bituminous Coal – More than 30 inches thick
▧	Lignite – More than 30 inches thick
▨	Lignite – Less than 30 inches thick
☐	Non-Commercial Grade Coal

Source: Montana Bureau of Mines & Geology,
Montana Department of Natural Resources
and Conservation, Oil and Gas Conservation
Division

MINERAL RESOURCE
POWDER RIVER COUNTY, MONTANA

FEBRUARY 1975



Source: Montana Bureau of Mines & Geology, Montana Department of Natural Resources and Conservation, Oil and Gas Conservation Division

MINERAL RESOURCE
POWDER RIVER COUNTY, MONTANA

FEBRUARY 1975

LAND USE

There are 2,102,400 acres of land in the District. Of this total 1,998,557 acres or 95 percent is used for the production of crops and livestock. The following table shows a breakdown of various land uses on private and state owned lands shown as in the 1967 Conservation Needs Inventory.

	Acres	%
Rangeland	1,218,201	82
Dry Cropland	150,970	10
Pasture	30,000	2
Forest Land	85,528	6
Other Land	5,500	t
Urban and Builtup areas	300	t

Rangeland constitutes the largest single land use in the District. These lands provide the primary resource for supporting the livestock industry. Dry cropland is used primarily for the production of cereal grains produced under an alternate crop-fallow system. Hay and pasture consist of tame grasses used interchangeably depending on the need.

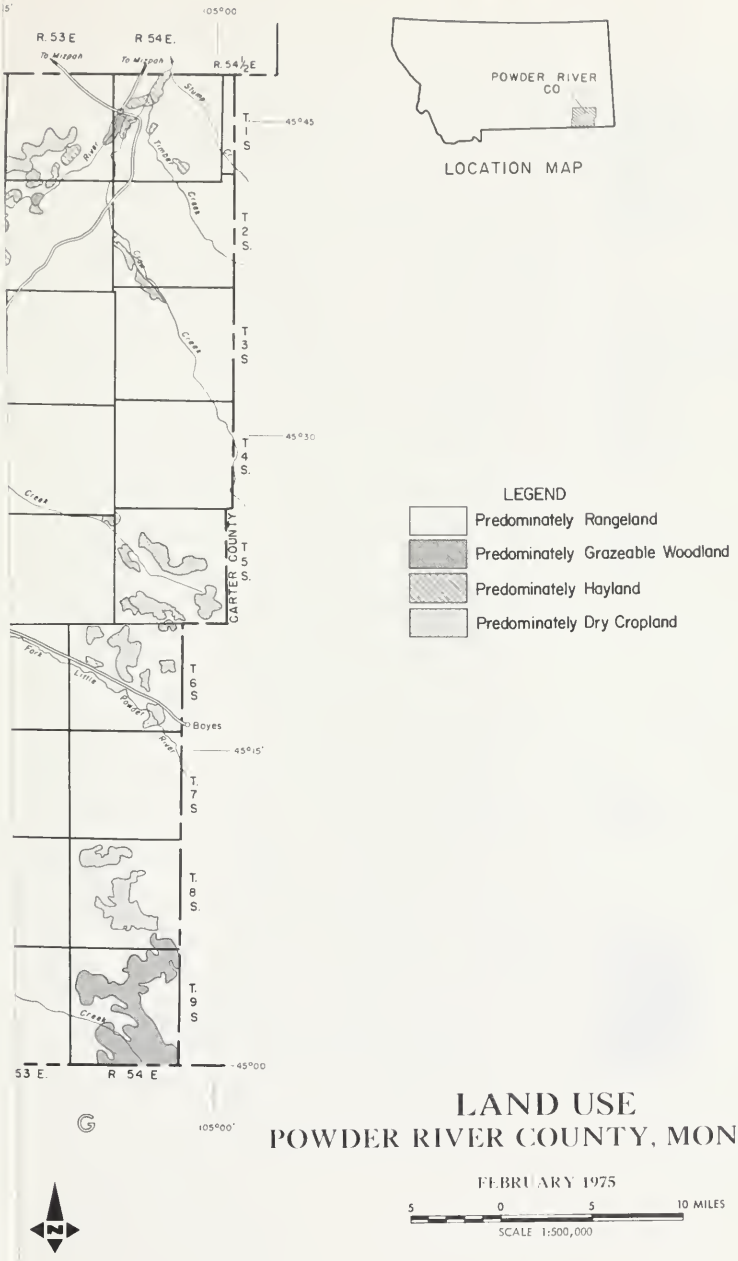
Forest land consists of timber areas found along major drainages and in the National Forest area in the western portion of the District. These lands are used for grazing and commercial timber harvest.

Other land includes farmsteads, farm roads, rural non-farm residences, investment tracts, country churches, schools, cemetaries, and small stock ponds and reservoirs less than two acres in size.

Urban and built-up areas in the District includes towns and other built-up areas of more than 10 acres, such as highways, roads, and industrial sites.

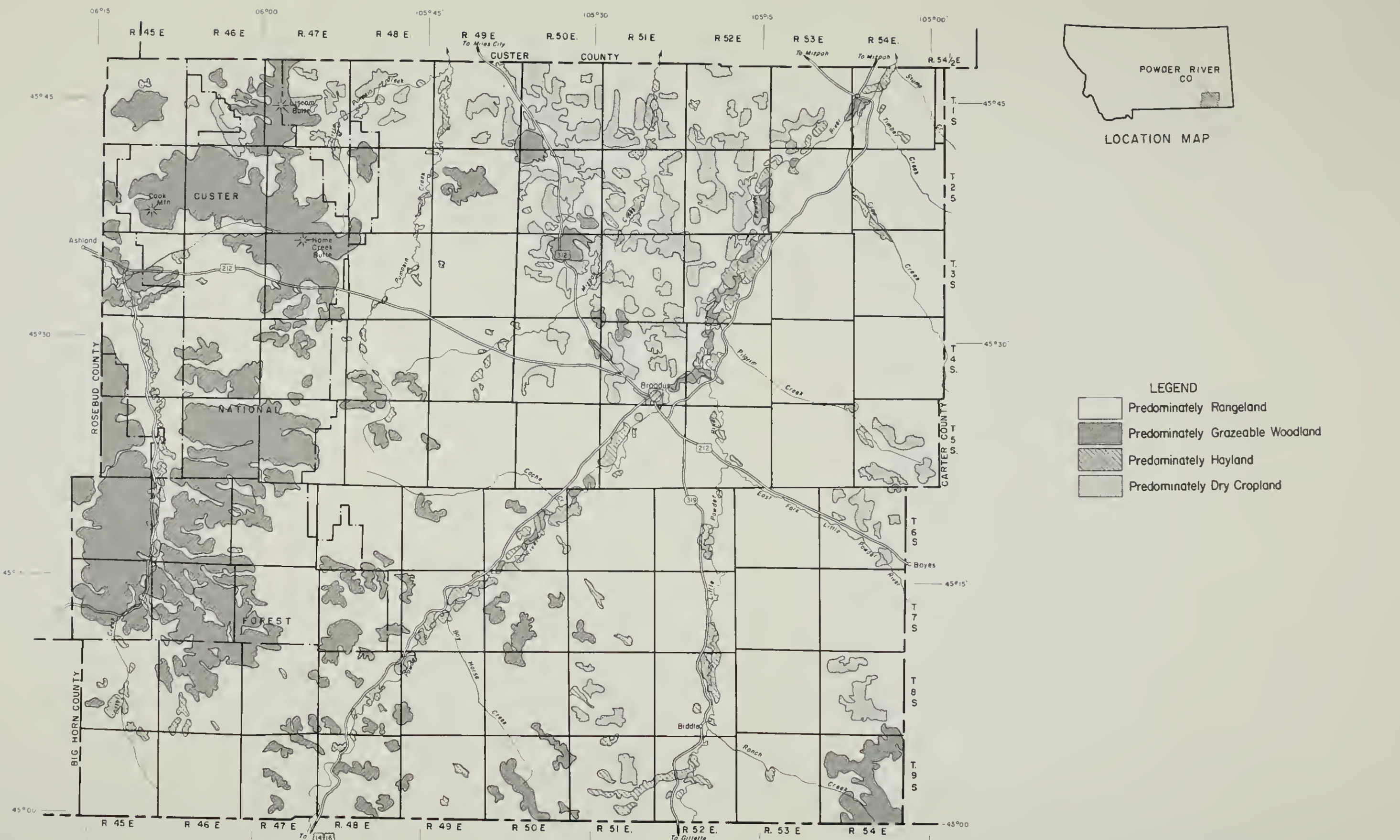
Small water areas are ponds, reservoirs and lakes that are from two to forty acres.

The district has not experienced any major land use changes in the past 15 years. During the period from 1958-1967, there was a slight increase in cropland and pasture acreage with a corresponding decrease in rangeland. It has been estimated that there has been a 10% increase in cropland in the last 3 years.



LAND USE
POWDER RIVER COUNTY, MONTANA

FEBRUARY 1975



LAND USE
POWDER RIVER COUNTY, MONTANA

FEBRUARY 1975

5 0 5 10 MILES

SCALE 1:500,000

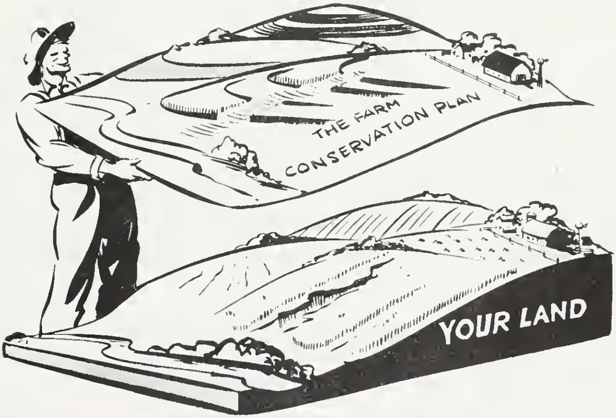
CONSERVATION PLANS

Approximately 160 operators have signed cooperative agreements with the District. Of these, 104 have completed conservation plans for the development and management of the natural resources. This totals approximately 688,672 acres or 32% of the area in the district. Forty-six operators have entered into a Great Plains Contract with the Soil Conservation Service including 312,028 acres or 14% of the area in the district.

Conservation Plans have been established in all areas of the District. Because of changes in land ownership, use and management techniques, there is a continuous need for revisions of these plans as well as the need to expand planned conservation to each acre in the District.

The following table shows district conservation plans by age distribution:

Plans less than 5 years of age	18%
Plans 5 to 10 years of age	39%
Plans over 10 years of age	43%



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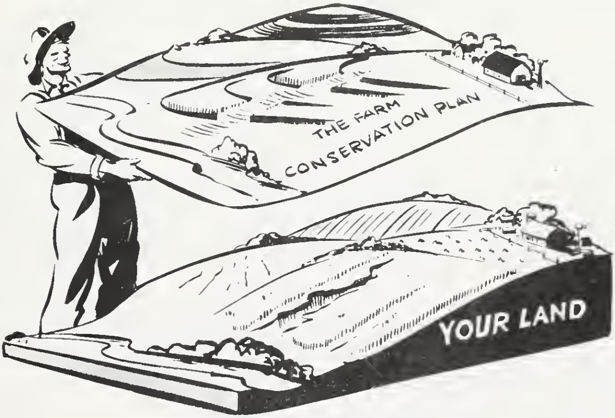


RANGELAND RESOURCE

Rangeland is made up of soils on which the plant cover is a combination of native grasses, forbs, and shrubs. These lands provide forage for livestock, wildlife habitat, protection of soil from erosion, watersheds, recreation opportunities, natural beauty, and areas for future development. There are approximately 1,822,300 acres of rangeland in the District accounting for 85% of the land use. Of this total, 1,098,200 acres or 60% are under private ownership, 614,100 acres or 33% are federal lands administered by the Bureau of Land Management and 110,000 or 6% are under state ownership.

Range condition is the present composition of vegetation of a range site in relation to the potential plant community for that site. Range condition studies show that approximately 65% of the range in the district is in good to excellent condition and 35% in fair to poor condition. Heavy use over a long period reduces the vigor of the plants and may result in their elimination. Grazing animals are selective and grazing pressure is heaviest on the most palatable plants, which are eventually grazed out if overuse of a range area is prolonged.

Cost and return studies of different levels of range management carried out by ranchers throughout the area proves that good range management has a tremendous economic impact. Range in good condition will net about $1.15 more return per acre than fair condition range.

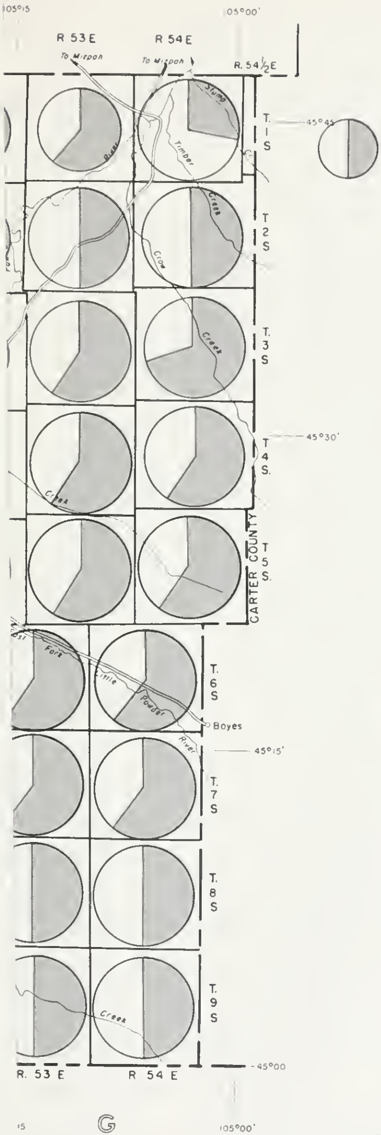
Approximately 20% of the rangeland is Class II and III land and is suitable for cultivation, however many of these areas occur in small isolated or irregular tracts that are not presently economical to farm.

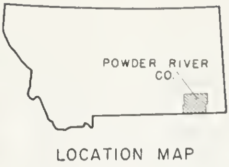
In addition to rangeland there are approximately 30,000 acres of tame pasture for a ratio of 1 acre of tame pasture for each 60.7 acres of range. Tame pastures consist of introduced tame grasses to provide supplemental grazing.

The raising of cattle and sheep are the main livestock enterprises. As shown in the following table, cattle numbers have shown a gradual increase since 1964.

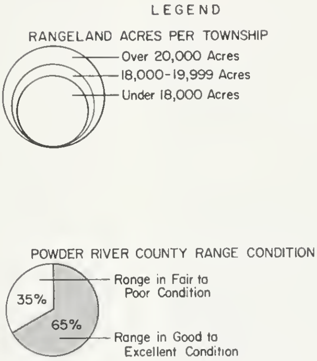
	1974	1970	1964
Cattle & Calves	95,200	78,000	65,000
Sheep & Lambs	30,700	53,000	62,500
Total	125,900	131,000	127,500

Source: Montana Agricultural Statistics





LOCATION MAP


LEGEND
RANGELAND ACRES PER TOWNSHIP
Over 20,000 Acres
18,000-19,999 Acres
Under 18,000 Acres
POWDER RIVER COUNTY RANGE CONDITION
35%
65%
Range in Fair to Poor Condition
Range in Good to Excellent Condition

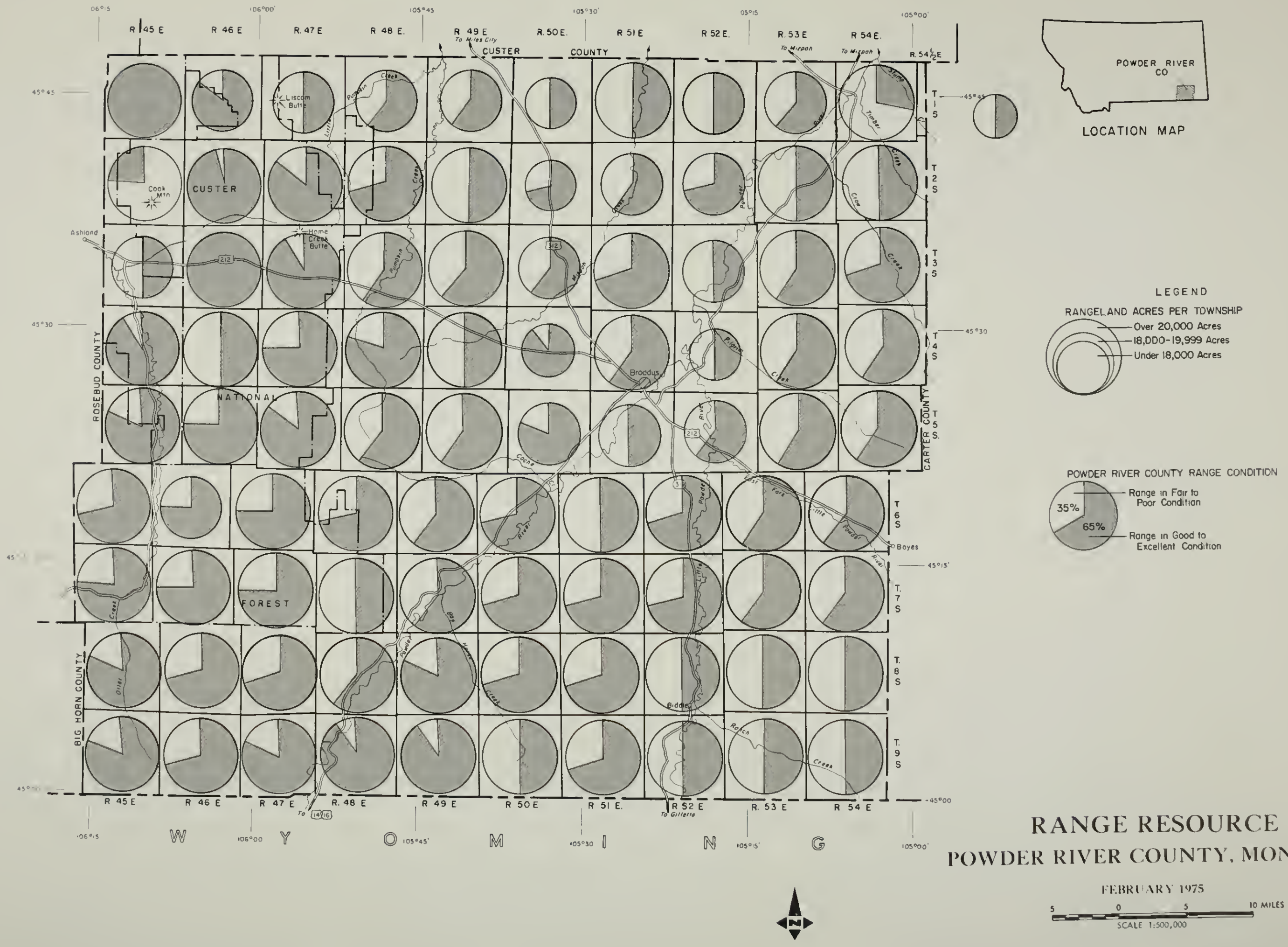
RANGE RESOURCE
POWDER RIVER COUNTY, MONTANA

FEBRUARY 1975

5 0 5 10 MILES

SCALE 1:500,000

M7-EN-23403-2



RANGE RESOURCE
POWDER RIVER COUNTY, MONTANA

FEBRUARY 1975

DRY CROPLAND

The major crops grown in the district are wheat, barley, oats, and alfalfa hay.

Following is a tabulation of crops by acres.

Crop	Acres Harvested * 1972	1973
Winter Wheat	24,300	25,300
Other Spring Wheat	1,900	1,500
Barley	5,200	6,300
Oats	4,300	6.700
Alfalfa Hay	40,200	44.300

There has been a trend in the past five years to devote more acreage to wheat.

Dryland crop yields vary considerably from year to year due to variations in rainfall and temperatures. Low rainfall received at the right time and coupled with cool temperatures can produce comparable yields of crops equal to years having five to six inches more rainfall. Conversely, years having 12 to 14 inches of precipitation (a normal year) may produce poor yields if the moisture falls as a series of light showers. Hail storms are also a problem in the district. Nearly every year crops in some part of the district receive hail damage. The following table shows the variability of crop yield in the district over a period of years.

Growing Season Precip.	13.74	17.91	13.67	13.21
Crop	*1964	1967	1970	1973
Winter Wheat	21.0	34.6	28.7	36.1
Spring Wheat	13.5	13.8	20.5	29.0
Barley	22.0	34.3	30.4	42.1
Oats	28.0	35.6	35.6	45.0
Alfalfa	1.03	1.49	1.35	1.47

* Data taken from Montana Agricultural Statistics
small grains - bu/ac. hay - tons/ac.

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The typical dryland cropping system used in the district is alternate small grain-fallow.

A number of producers are using commercial fertilizers to increase yields. Both nitrogen and phosphate are being used in blends of 11-48-0 and 18-46-0 applied at an average rate of 80 pounds per acre.

PHOTO BY TAILA J. TALCOTT

AGRICULTURAL INCOME

Agriculture is the second largest and most stable industry in the District.

Cash farm receipts from the sale of agricultural products rose from 6.8 million dollars in 1968 to 9.5 million dollars in 1971. During this period, livestock and livestock products have accounted for approximately 71% of the total cash farm receipts.

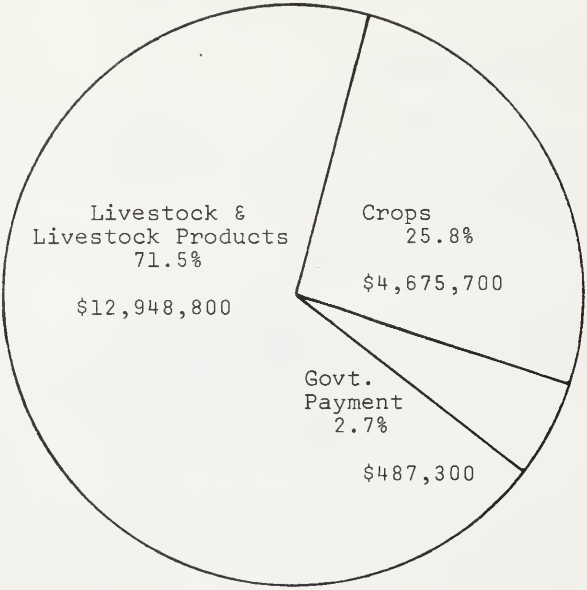
The following table shows the average cash receipts per farm as compared to the average for the state:

	1968	1969	1970	1971	1972	1973
Co. Average	$25,233	31,238	29,423	30,691	40,425	49,486
State Aver.	21,316	23,007	25,955	27,582	36,352	45,381

In 1973 farms in the district ranked 29th among all Montana counties in average cash receipts per farm.

The distribution of farms by economic class shows the number of farms by sales grouping. It is interesting to note that 33% of the farms had sales exceeding $20,000. Only 5% of the farm operators reported 50 days or more of off-farm work.

AGRICULTURAL INCOME



Total - $18,111,800

1971 Montana Agricultural Statistics

FARMS BY ECONOMIC CLASS

Class	Sales	No. of Farms	% of Farms
I	$40,000 & over	56	15
II	20,000-39,999	87	24
111	10,000-19,999	94	26
IV	5,000- 9,999	53	15
V	2,500- 4,999	41	11
VI	50- 2,499	14	4
Part-Time		12	3
Part-Retirement		7	2

RECREATION & HISTORIC AREAS

The Powder River Conservation District in Eastern Montana is best known for its river. "Powder River Let 'Er Buck" "..A mile wide and an inch deep, too thin to plow and too thick to drink." echoes still today. The county gets its name from the bluish-gray clay and sand along the banks of the Powder River. This clay and sand looks like gunpowder.

Indian encampment sites are found throughout the area overlooking the vast prairie grassland.

Much of the early history is associated with large cattle ranches. There were numerous large herds that had been established in the area. This was followed by homestead days of the 1900's and the development of numerous community trade centers. These have since served their purpose and Broadus is the only remaining trade center in the district.

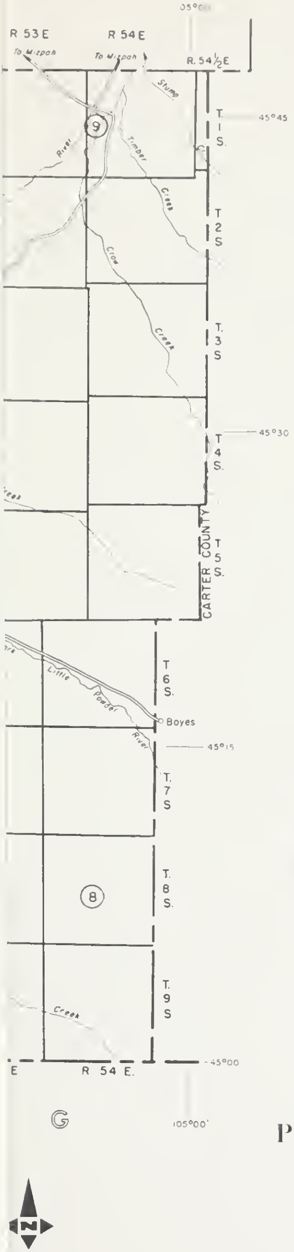
Recreation facilities found in or near the town of Broadus include camping areas, rodeo arena, county fair grounds, City Parks, baseball fields, swimming pool, golf course and museum.

Access to land and water areas for recreational purposes is a problem that will need attention. In the past five to ten years recreation vehicles have increased rapidly in number. Snowmobilers have increased at a rate comparable to the other northern states. The forest is the only large area of public lands that is being used for recreational purposes.

Big game hunting profices a large recreational attraction for both local and out of state hunters. The greatest take consists of mule deer, followed by antelope and white-tailed deer. Sharptail grouse, hungarian partridge, ring-necked pheasant, turkeys and sagehens along with limited amounts of waterfowl, provide recreation in the form of small game hunting.

Recreation in the form of fishing is provided by the numerous farm reservoirs stocked by the Montana Fish and Game Dept. with trout and warm water species. Some fishing for catfish and northern pike does occur on the Powder and Little Powder River.

Additional information on early history of the area can be found in "Echoing Footsteps", a book prepared by local residents in 1967. It recalls the early settlement of communities in the county with family accounts of the cattle ranching and homesteading eras.



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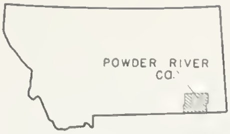


LOCATION MAP

LEGEND

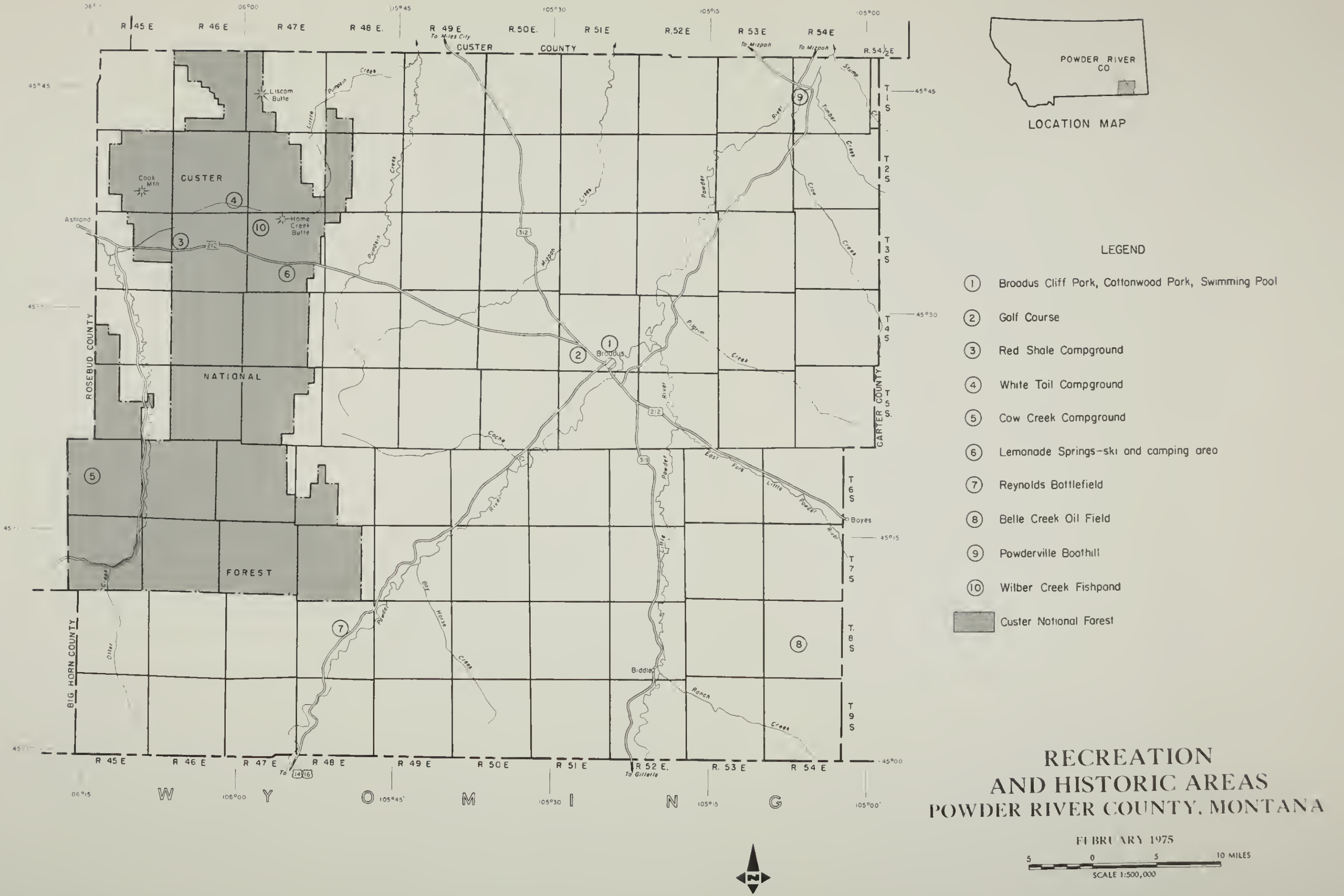
①	Broadus Cliff Park, Cottonwood Park, Swimming Pool
②	Golf Course
③	Red Shale Campground
④	White Tail Campground
⑤	Cow Creek Campground
⑥	Lemonade Springs-ski and camping area
⑦	Reynolds Battlefield
⑧	Belle Creek Oil Field
⑨	Powderville Boothill
⑩	Wilber Creek Fishpond
▨	Custer National Forest

RECREATION AND HISTORIC AREAS POWDER RIVER COUNTY, MONTANA

FEBRUARY 1975

5 0 5 10 MILES

SCALE 1:500,000



RECREATION AND HISTORIC AREAS POWDER RIVER COUNTY, MONTANA

FEBRUARY 1975

COMMUNITY FACILITIES

Powder River County is supplied by several facilities. Mountain Bell with it's office in Miles City provides telephone service to Broadus, also along 212 as far west as Charles Alderman and Earl Aye, and to the East along 212 as far as Earl Clark and Norman Bruce, to the North along the Powder River as far as Dennis Jurica and south along the Powder River as far as J.L. Wilson. Range Telephone Cooperative, Inc. with its office in Forsyth provides telephone service for the rural communities and Belle Creek.

Electrical power is supplied by the Tongue River Electric Cooperative located in Ashland, Montana. Broadus is the hub of the system and is connected to Ashland by a sixtynine kilovolt line. Major lines run to Coalwood and Powderville in the morth and to Biddle and Moorhead in the south. The western part of the county is served from the line between Ashland and Broadus. Power is supplied to the Tongue River Electric Cooperative by the United States Bureau of Reclamation and the Montana Power Company. The community of Belle Creek is supplied power by Black Hills Power and Light with its home office in Rapid City.

Propane is the main home and commercial heat, with heating oil and coal also used.

Cal-Gas and Wheatwell Propane are the main distributors o propane in and around Broadus. Belle Creek has some natural gas from the oil wells of that area.

The main users of heating oil are the Elementary and High School in Broadus. The Jeakins Memorial Clinic and the U.S. Post Office also use heating oil.

The Powder River County Courthouse and Library use coal as a heating source. It is hauled from Sheridan, Wyoming.

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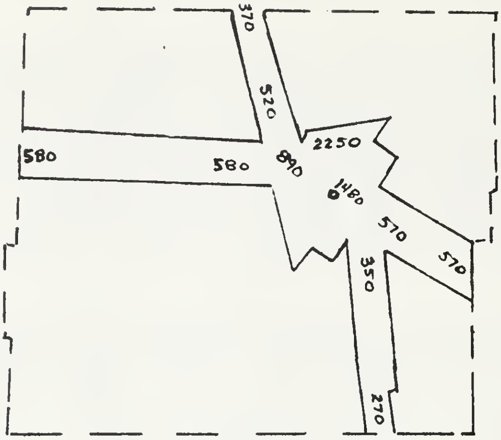
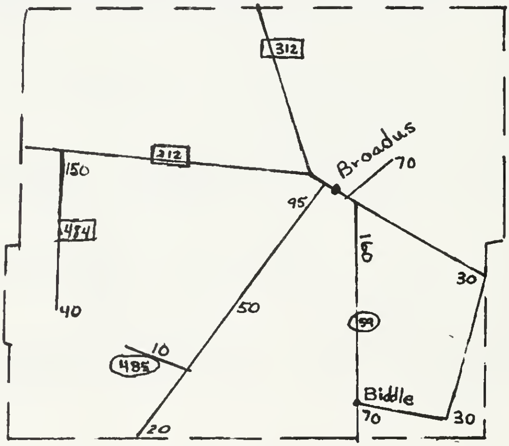
1970 Traffic Flow Map - Primary System



1970 Traffic Flow Map - Secondary System



Total Traffic is the annual 24 hour average including all types of motor vehicles. Figures are the total at the closest highway intersection.

TRANSPORTATION & MARKETING

Transportation and Marketing are an integral part of the modern production system. Efficient and rapid movement of people, raw materials, and finished goods to and from an area is essential to community development.

Transportation

Highway transportation in the district includes Highway 212 running east and west. Highway 312 runs from Broadus to Miles City and Highway 59 from Broadus to Gillette, Wyoming. In addition, there are approximately 1239 miles of secondary county roads in the district.

There is no rail service in the district. Daily mail and freight service is available from Miles City.

A County airport exists in Broadus, but no commercial air service uses the facility; however private air craft do use the facility.

Marketing

Nearly all of the small grains produced in the district are marketed through elevators in Miles City or Belle Fourche.

Livestock are marketed throughout yards in Belle Fourche, St. Onge, S.D., or Miles City or sold directly off the ranch to feeder buyers.

TAXATION

The 1972 Taxable valuation of Powder River County was $16,710,359. This has increased to $34,917,305 in 1974 and $74,183,120 in 1975. The large increase in valuation is due to oil production and the increased value of the resource. The assessments of net proceeds and royalties increased from $9,655,580 to $66,278,089. The royalties comprised almost 90% of the 1975 taxable valuation in 1975. The following gives a breakdown of taxable valuation as of July 1972.

	Taxable Valuation	% of Total
Property other than Public Utilities	6,601,881	40.0
Local property of Public Utilities	53,831	0.3
Public utilities allocated by State	217,543	1.3
Assessment of Net Proceeds & Royalties	9,655,580	58.4
	16,528,835	100.0

There are 17 school districts in the County with different mill levy requirements in each. The total average mill levy for state, county and schools in the past four years is shown in the following table:

Year	Average mill levy for state, county, and schools
1972	83.13
1973	98.80
1974	132.01
1975	98.12

The 1972 taxable valuation for all agricultural land and improvements was $2,075,733 representing 12.4% of the total County valuation. The average taxable value of all agricultural land in the district is $1.53 per acre. This compares with $1.70 for Wibaux County, $1.59 an acre for Dawson County, $2.33 an acre for Richland County, $1.45 for McCone County and $1.20 for Fallon County.

POPULATION

Powder River County, unlike most eastern Montana counties has been faced with an increasing population. During the period from 1950 to 1970, population increased 15% compared to an 18% decline for other eastern Montana counties.

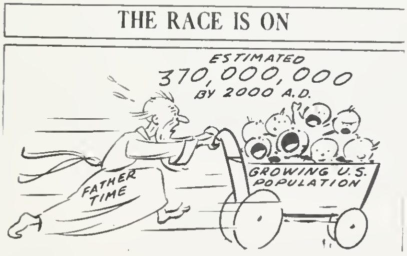
Population projections continue to show a gradual increase through 1990.

The town of Broadus increased from 19% of the county population in 1950 to 27% in 1970. Belle Creek was estimated to account for 10% of the 1970 census.

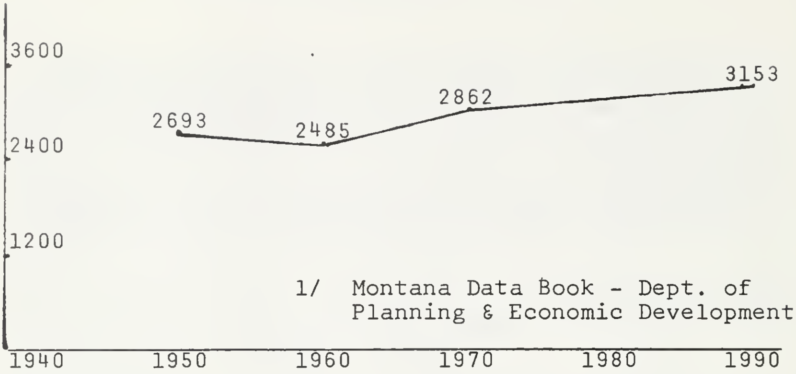
	1950	1960	1970
Town of Broadus	517	628	799
Rural	2,176	1,857	2,063
County Total	2,693	2,485	2,862

Powder River County is classed as a rural county. The town of Broadus with a population of 799 is the only trade center in the district.

As shown by the age distribution chart, the heaviest migration occurs in the age groups after high school to the mid-20's. This is the result of high school graduates moving from rural areas seeking employment, going to college or entering military service.

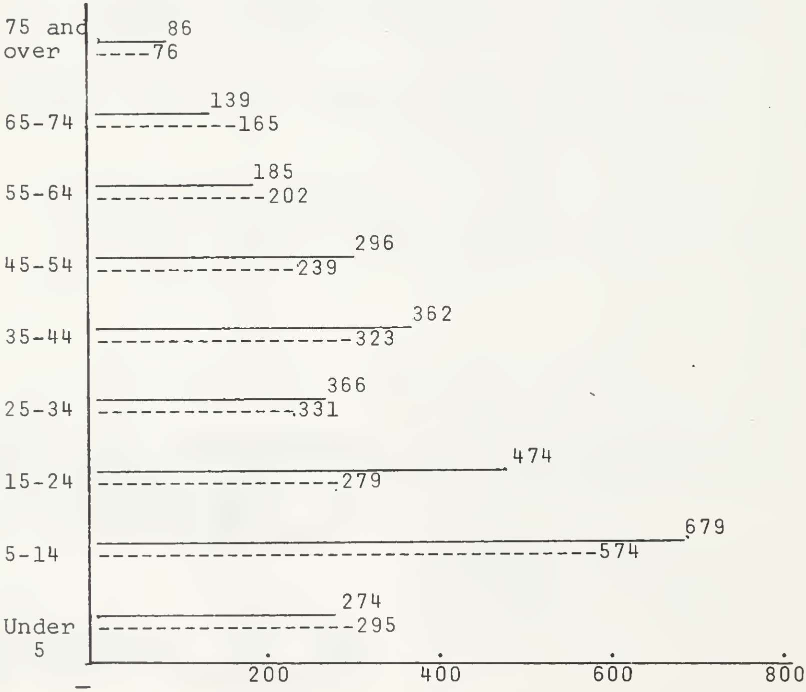


POPULATION TRENDS & PROJECTIONS 1/



1/ Montana Data Book - Dept. of
Planning & Economic Development

POPULATION BY AGE DISTRIBUTION 1970 2/



2/ U.S. Dept. Commerce
Bureau of Census

1970 ______ 1960 -----

INCOME

Based on the poverty definition as used in the 1970 census report, 63 or 10.3 percent of all families had incomes less than poverty level. This is slightly higher than the surrounding counties of Richland, Dawson, and Fallon. One-hundred and twenty-six families or 17.2% had incomes less than 125% of poverty level. Most families in this category spend virtually all of their income on the necessities of food, clothing, shelter, transportation and medical care.

Family Income - 1969

	Non-Farm Families		Rural-Farm Families	
	No.	%	No.	%
Under $3,000	32	8	47	14
3,000-5,999	102	26	91	28
6,000-8,999	82	21	73	22
9,000-11,999	74	18	21	6
12,000-14,999	38	9	29	9
15,000-24,999	54	13	51	16
Over 25,000	20	5	17	5
	402	100	329	100

U.S. Bureau Census - 1970

Employment

Nearly one-half of the labor force is directly employed in agriculture and a large portion is engaged in service to agriculture. The distribution of employment is shown in the following table.

Employment by Industry Groups

Agriculture	403
Mining & Construction	178
Public Administration	196
Transportation & Utilities	14
Trade Service & Finance	80
Professional, Educational and Religious	40
Total	911

Powder River Situation Statement

PHOTO BY JESSIE T

SECTION IV
POLICIES, GOALS, & OBJECTIVES

Education and Information

Policy: Encourage an accelerated education and information program to convey a basic understanding of the need for proper land use to all segments of society.

Goal: Develop educational and informational programs on various phases of the Conservation districts program.

Objectives: Meet with the local editor and outline an information program to be carried regularly in the paper.

2. Meet with the administration of the various school systems to discuss the possibility of Outdoor Classroom.
3. Coordinate the information program with the Extension Service.
4. Sponsor meetings on subjects of immediate importance to local people.
5. Develop an educational program to be used with youth groups.
6. Develop a schedule to discuss district happenings with Commissioners, planning board and other local groups.
7. Develop a conservation newsletter to keep cooperators informed on district activities.

Human and Economic Resources

Policies: Land use policies should be oriented toward protection of the aesthetic values, which are an integral part of our history and way of life. Land use policies should consider the impact and influences of the property tax structure. Tax structure should encourage agriculture, wildlife, recreation and similiar uses of land in the public interest. The rights to economic opportunity and freedom of choice in the use of land should remain with the land-owner so long as they do not destroy the resources or conflict with a safe,clean and healthy environment for society.

Goal: Work with the local and state units of government on land use regulations, tax structure, and the development of recreational and historical areas for the benefit of all people in Powder River County.

Objectives: Encourage the local units of government to make sound land use policies based on factual resource information.

2. Encourage and assist historical groups to inventory archeological and historic sites.
3. Assist in inventorying potential recreation sites.
4. Conserve prime agricultural lands.
5. Identify and preserve social values.

Cropland

Policy: The lands capabilities, limitations and potentials are identified by soils and other related resources.

Goal: To have 80% of the cropland in Powder River County under a Conservation plan by 1990.

Objectives: Encourage all operators to use the published Soils survey as a basis for determining potential cropland areas.

2. Encourage operators to seed back to native vegetation areas not suited to continuous cropping systems.
3. Encourage operators to use all Conservation practices available to protect the resource and enhance the environment.
4. Develop an information and educational program to continually keep farmers informed of means to improve production while protecting the cropland resource.
5. Encourage operators to institute "Best Management Practices", that is...those practices determined to be practicable and most effective in preventing or reducing the amount of pollution generated by a non-point source to a level compatible with water quality goals.

Minerals

Policy: After mining, construction, and similar activities which alter and destroy the surface, the land must be treated and reclaimed for future use.

Goal: Work with local units of government and private groups in developing standards for reclamation of disturbed areas.

Objectives: Meet with Planning groups, County Commissioners, city government and others to discuss and develop standards for reclamation of all disturbed areas.

2. Meet with the Oil and Gas Commissioners to review policies on reclamation of abandoned oil wells, disposal pits, pipelines, etc.

3. Provide input into any impact statements on proposed coal development projects.

4. Encourage the use of the Soil Survey as a basic tool in determining fragile areas and areas with few limitations.

Rangeland

Policy: To develop and improve the rangeland resource for maximum production, protection of the soil resource and to prevent or reduce sediment pollution of water.

Goal: Refer to goals of the Montana Rangeland Resource Program.

Objectives: Conduct an active information program on used of rangeland.

2. Conduct tours for operators and non-operators to stress the need to improve rangeland condition.
3. Work with the society for Range Management Old West Regional Commission Coordinator in developing an aggressive rangeland program.
4. Hold Cost-returns meeting to emphasize the potential economic gains that can be obtained by improving the rangeland condition.
5. Appoint a County Range Leader to help carry out the state Rangeland Resource Program.
6. Encourage operators to instutute "Best Management Practices", that is...those practices determined to be practicable and most effective in preventing or reducing the amount of pollution generated by a non-point source to a level compatible with water quality goals.

Water Resources

Policy: To provide broad direction and coordination in maintaining water quality while attaining maximum beneficial use of the surface and ground water resources.

Goal: Review water development projects annually to assure a proper balance of available water and development within each drainage basin.

Objectives: Develop a water use plan.

2. Make application of reservation of water on the major drainages in accord with DNR regulations.
3. Encourage land management practices that will reduce runoff and stabilize highly erodable soils.
4. Integrate the resources of total watershed areas in planning water development projects.
5. Encourage a complete study of ground water resources.
6. Provide input to studies on water quality monitoring sediment and other sources of pollution.
7. Inform eligible individuals of the opportunities to develop natural resources under the Renewable Resource Development Loan Program.

SECTION V
PROBLEMS & OPPORTUNITIES

PLANNING AND DEVELOPMENT

The Conservation District can contribute significantly to the effectiveness of a resource planning program. The data on the natural resources of the district can help in determining the effects of both urban and agricultural uses on these resources. in resource planning and development, the apparent problems often are not the real proglems but rather symptoms of several related problems. Each must be identified and dealt with in a manner that will treat the eymptom and effect a cure. In this section the problems relate to each major resource, and the opportunities which follow list ways in which the District will attempt to solve these problems.

Problems

1. Full use is not being made of the soil survey report in the district due to lact of interpretative data on engineering properties, urban uses, etc.

2. In the past there has been no current plan to guide development of the natural resources in the district.

3. Approximately 55 percent of the agriculture land area is presently not under a district conservation plan.

4. County-wide land use planning and regulations have not been developed.

5. There is a need for water use reservations; surface and ground-water.

Opportunities

1. Work toward getting soil survey report updated to meet present day criteria.

2. Encourage continuation and further development of county-wide planning board in the town of Broadus.

3. Work closely with county planning board to insure coordination of programs and projects.

4. Provide to the planning board inventory data on natural resources for use in making sound planning decisions.

5. Provide one supervisor to serve as a member of the county planning board as per Montana statutes.

6. Develop committee structures of associate supervisors, youth boards, governing bodies, civic groups and other interested persons to forward the efforts of the district in all resource activities.

7. District employees will be used as available to assist in various phases of conservation planning.

8. District supervisors will encourage the development of conservation plans to neighbor farmers and ranchers.

9. Make use of other programs, such as the Great Plains Conservation Program to encourage the development of Conservation plans.

10. Establish planning priorities to reflect the treatment needs of the land.

11. Determine domestic, waterspreading, recreation, irrigation, stockwater, urban and other water-using potentials on the major drainages in Powder River County and make appropriate reservations of such.

CROPLAND RESOURCES

Rapid fluctuation of prices for farm products are expected to encourage producers to intensify production to bring low intensive use land into production, to modify established cropping patterns and possibly to bring some grassland into crop production. District supervisors urge, however, that producers consider all available alternatives before making radical changes in their operations.

Problems

1. There are approximately 10,000 acres of Class 6 land presently being cropped. Grain production on these lands is generally not feasible due to low yields and high erosion hazards.

2. Better crop residue management is needed on 75,000 acres.

3. Strip cropping and associated practices are needed on 40,000 acres for wind and water erosion control. Changes in cropping systems to include more second cropping has resulted in a tendency to destroy certain practices such as stripcropping.

4. Crop yields vary considerably due to variations in precipitation, climatic factors, and management.

5. Much of the fertilizer application is not based on soil tests. This results in inefficient use. The problem is further compounded by shortages and inadequate commercial and on-farm storage facilities.

6. With approximately 75% of the harvested crop being wheat, there is a need for additional alternate crops to meet the demands of changing cropping systems.

7. Restrictions have been placed on certain chemicals for weed and insect control.

Opportunities

1. Develop an information program to point out the need and benefits of converting Class 6 lands to permanent cover, and maintaining Class 6 land in permanent cover.

2. Recommend that high priorities for cost-share programs be placed on conversion of Class 6 lands to permanent cover.

3. Encourage livestock management system to properly utilize forage production from Class 6 lands.

4. District will review conservation planning requests and establish priorities to reflect the needs of the land.

5. Conservation practices to control erosion will be based on a detailed study of the problem and a thorough analysis of alternative treatments on record in a conservation plan developed by the cooperator.

6. Studies presently being conducted indicate that weather modification may influence patterns and amounts of rainfall in the District. The district recommends that research be limited to specific and carefully designed projects to study its effects on production, cropping systems, erosion, runoff and other consequences which may result from weather modifications.

7. Maximize the use of fertilizer by encouraging application rates based on soil tests. Develop an information program on procedures for accurate soil analysis.

8. Encourage the proper storage and handling of fertilizer materials.

9. Encourage the development of well-planned cropping system using recommended varieties and high quality seeds along with cultural management practices to increase production and reduce problems of weed and insect control.

10. Encourage the use of available programs to aid producers in the establishment of conservation practices to protect soil from erosion.

11. Encourage the continuance and expansion of publicly financed cost-share programs for developing conservation practices.

12. Urge continuous support of technical and information agencies to provide expertise and coordination in applying the needed practices.

RANGE

The improvement of our environment and a potential for increased income are available to local ranchers and the general public through better rangeland management. Approximately 75% of the agricultural income is derived from the sale of livestock and livestock products. Range improvement will directly reduce soil losses from wind and water erosion on rangeland. Water and air pollution will be minimized. Stream flow stabilization and a clean sediment-free water supply will result from improved range management.

Problems

1. 35% or 425,000 acres of private and state rangelands are in need of additional treatment.
2. Need to develop a better understanding of the rangeland resource by ranchers and other users.
3. Lack of adequate water supplies to provide necessary water for efficient forage utilization during all seasons.
4. Economic loss due to 35% of the rangeland in fair to poor condition.
5. Competitive use of rangeland for livestock production, wildlife and recreation.
6. Need for better understanding of the rangeland resource by consumers.
7. Losses of livestock due to predators and reduced forage production from rodents and insect infestations.
8. Forage production varies considerably due to variations in precipitation and other climatic factors and management.
9. Loss of forage production due to increase of noxious weeds in some areas.
10. Need for increased management on fragile lands to reduce sediment pollution.

Opportunities

1. In order to attain the district goals in the rangeland program of improving the rangeland resource, there will

be established a coordinated effort between the Rangeland Resource Committee and the district to attain the goals established by the committee.

2. Encourage that the development of the rangeland resource be considered in its proper perspective and coordinated with other land use planning decisions in the district.

3. Broaden the information and educational program to develop a better understanding of the rangeland resource program and to include various management systems.

4. Serve in the area of predator control, by functioning as a liaison between local ranchers and predator control agencies.

5. Studies presently being conducted indicate that weather modification may influence patterns and amount of rainfall in the district. The district recommends that research be limited to specific and carefully designed projects to study its effect on forage production, changes in plant communities and animal populations, erosion, run-off and other consequences which may result from weather modification.

6. There is an economic potential for various types of recreational development especially in the areas of fee hunting and vacation farms and ranches.

7. There is a potential for additional livestock feeding which will make more efficient use of local resources and expand the economic base of the community.

8. Encourage the use of well designed grazing systems to bring about improved range condition and greater economic returns.

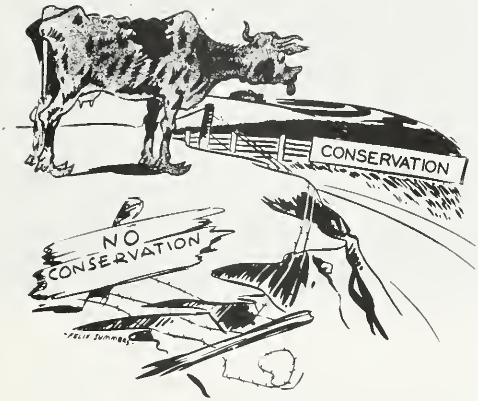
9. Encourage additional research which contributes to increased forage production and protection of the rangeland resource.

10. Encourage the use of tame grasses to increase forage production and provide protection to native grasses during critical growing periods.

11. Place planning priorities on critical erosive lands to reduce sediment production.

12. Encourage the use of available programs to aid ranchers in conservation practices to protect the rangeland resource.

13. Determine needs for stockwater and waterspreading developing and make reservations of such.



THE GRASS IS GREENER ON THE OTHER SIDE OF THE FENCE!

PASTURE AND HAYLAND

The improvement of an environment and a potential for increased income are available to local ranchers and the general public through better use and more development of pasture and hayland.

The development and use of pasture and hayland will enhance and provide more rangeland management opportunities.

Problems

1. Obtaining water rights for development and management of hayland and pastureland.
2. Proper management due to inadequate fencing and water supply.
3. Poor management of pastureland and hayland.
4. Need for plant species adaptability and limitations.
5. Need for imporved fertilizer program based on adequate soil tests.
6. Need for development of more productive hayland through use of water systems.
7. Need for better water management on systems.
8. Limited varieties of grasses suitable for these climatic conditions.

Opportunities

1. Determine water needs for livestock water and water-spreading developments and make reservation for such.
2. Develop education programs on pasture and hayland management:

   a) combining native range with tame pasture
   b) rotation of tame pasture
   c) plant species and suitability
   d) fertilizer response
   e) proper water management
   f) effect of grazing hayland

3. Encourage development of new and improved species suitable for this area.

WATER RESOURCES

Water is rapidly becoming a priceless resource and there are increasing demands to improve its quality. Community growth, agricultural needs, recreational uses and industrial development, are dependent on adequate supplies of good quality water.

Problems

1. Excessive run-off causes flooding which damages croplands, roads, bridges and dwellings built on flood plains.
2. High sediment loads carried by flood waters causes silting of water storage impoundments and damage to fish habitat.
3. Better utilization of water to increase feed production.
4. Variations in seasonal flow on all drainages resulting in under utilization of the water resource and loss of an economic opportunity.
5. Undetermined effects of potential strip mining on ground water acquifers.
6. Mixing of ground water aquifers from drilling and development of wells and exploration studies.
7. Reduction of artesian pressures to excessive use and waste.
8. Potential deterioration of ground water sources due to injection of walt water into oil fields.
9. Obtaining water rights for development.
10. Competition for water.

Opportunities

1. Encourage land management practices that will reduce runoff and stabilize highly erodable soils.
2. Encourage the development of potential waterspreading projects, springs, pipelines, and other stockwater developments.

3. Integrate the resources of the total watershed area in planning water development projects.

4. Encourage inter-agency cooperation in developing community betterment projects.

5. Encourage complete study of ground water resources.

6. District will assist in water quality study to determine sources of pollution and accelerate planning assistance to these areas where needed.

7. To develop a water use plan for reservation of water under the Montana Water Law for irrigation, recreation, etc.

8. Identify critical sediment sources and give priority to the people who own these lands to help them develop conservation plans which will meet current standards.

MINERAL RESOURCES

The natural gas and oil deposits developed in the district will continue to be an important resource. Coal deposits are extensive and are presently being considered for development. This development will have a tremendous impact on the economic, social and environmental aspects of the community.

Problems

1. More information is needed on the effects of mineral exploration and development in regard to the quanity and quality of the ground water resources.
2. There is a lack of information pertaining to the development of coal resources.
3. There is a need for a better understanding by ranchers of leasing practices and arrangements.
4. Strip mining may result in accelerated erosion, sediment damage, water pollution and associated reclamation problems.
5. Many of the mineral rights are not under control of the surface owner.
6. Division of mineral rights from surface rights causes problems and extra costs to the surface owner, for keeping abstracts current.
7. Trespass by exploratory companies is practiced on county right-of-ways where only an easement has been granted.

Opportunities

1. The development of the coal resources will result in new industry and provide more employment for the area.
2. Encourage more reclamation studies aimed toward bringing mined land back into productive cropland status.
3. Encourage further studies of the ground water resources in the area.
4. Encourage the development of by-products resulting from various forms of coal processing.
5. Encourage educational programs to better acquaint landowners with all aspects of mineral leasing practices.

RECREATION & HISTORIC AREAS

Appraising the potential for recreation is an essential step in planning to meet the recreational needs of the community. Recreation is the most under-developed resource in the district. The development of this resource could provide an increase in the economic base of the community.

Problems

1. There is a need for additional recreational developments to meet the needs of all age groups.

2. There is a need for more water-based recreation facilities.

3. There is a need to educate local people of the economic opportunities through the development of recreation.

Opportunities

1. Establish a better liason between various agencies during the early planning stages of road design in order that more consideration can be given to the development of watershed recreation facilities.

2. Work with and encourage local people to consider the development of an over-all recreation plan for the entire community.

3. Encourage educational programs to inform farmers and ranchers of the opportunities in the areas of recreation development.

FISH & WILDLIFE RESOURCES

Fish and wildlife resources are an important resource in the district. With the increased growth of outdoor oriented recreation, this resource will become an even more important consideration in the overall resource development program in the district.

Problems

1. A few careless and irresponsible people have caused poor relations between landowners and sportsmen.
2. There is no active local sportsmens group to establish a liaison between landowner and sportsman.
3. Public access and developed facilities for existing fish ponds are inadequate.
4. More pressures are being placed on private land each year for hunting.

Opportunities

1. Inform landowners of potential for various types of recreational developments, especially in the areas of fee hunting, guide service and vacation farms and ranches.
2. Encourage where practical, the development of wildlife habitat areas in conservation planning.
3. Consider items beneficial to wildlife development in the design of conservation practices such as fencing of structures, selection of species adapted to providing food and cover for wildlife, etc.
4. Establish a better liaison between various agencies during the early planning stages of road design in order that more consideration can be given to the development of water impoundment areas suitable for fisheries.
5. Sponsor programs designed to promote better relationships between sportsmen and landowners.

OTHER LANDS

Other lands in the district consist primarily of roads, farmsteads, rural schools, churches, cemetaries, etc. These areas if not properly treated can become sources of sediment production or areas for noxious weed infestation. It is estimated that 2/3 of the other land in the district is in need of additional treatment measures.

Problems

1. These lands without proper conservation measures, can be a major source of sediment pollution to rivers and streams.
2. These lands without proper treatment provide areas for noxious weed infestations.
3. Unstable ox-bows, streambanks, and headcuts are depositing silts into waterways.
4. There is a need for additional farmstead and feedlot windbreaks and a need for renovation of numerous older windbreaks.

Opportunities

1. Shaping of existing and newly constructed borrow areas along with stockpiling of topsoil will assist in getting these areas revegetated sooner, thereby reducing erosion and opportunity for noxious weed infestation.
2. Planting of trees add to the beauty of the countryside, and provide additional areas for wildlife habitat.
3. Consideration will be given to the protection of streambanks when projects are developed which may adversely affect the bank, channel or course of the stream.
4. The district will encourage proper measures to control existing streambank erosion problem areas.
5. The district will place increased emphasis on establishment of farmstead and feedlot windbreaks to provide increased soil protection, improved wildlife habitat and aesthetic value.

HUMAN & ECONOMIC RESOURCES

A number of social and economic problems relate to the population of the area. Many are deep seated and historical. Others are extensions of social changes affecting the state and nation. Development and improvement of public and community facilities will enhance the general economic and social climate of the entire district.

Problems

1. Out-migration of young people and lack of year-round employment opportunities has caused a decline of population.

2. Farm numbers have been continually declining.

3. Lack of experienced farm labor because of its seasonal nature.

4. Lack of public transportation facilities and services to satisfy the needs of the agriculture community.

5. Rapidly rising costs of goods and services along with land value are making it increasingly difficult for existing operators to expand their enterprises.

6. Need for additional adequate solid waste disposal facilities.

7. There are limited medical services or facilities in the district.

Opportunities

1. Encourage an on-going program to provide facilities and education for training a labor force to meet the needs of agriculture.

2. Encourage local leadership to recognize the potential for economic and social development of the community.

3. Promote the construction of private and community solid waste disposal sites through local, state and federal financing.

4. Continue to encourage information and training programs that will help keep farmers and ranchers informed of new technology management skills, market facilities and new or improved plant species.

SECTION VI
IMPLEMENTATION & ADOPTION

IMPLEMENTATION

There are numberous techniques for implementing different elements of the districts program. However, the use of each technique will be specifically fitted to the policies, goals and objectives of the district.

A. General Implementation Tools

1. Conservation District Organization, Plan of Work and Projects.

The Conservation District law provides broad authorities for implementing a Conservation District program. The District will provide leadership and utilize all possible assistance in carrying out their program. Standing committees and special committees, such as the Range Resource Committee, will be used as needed to further the objectives of the program.

Regular monthly meeting will be used to review progress and stimulate activities toward implementation of the District program.

2. Conservation District Cooperator Agreements

Voluntary agreements are negotiated between the conservation district and the individual land occupiers or group, association, or entity of government to supply certain services according to a plan such as a Farm or Ranch Conservation Plan, a Range Management Plan, or engineering plans for a specific conservation practice.

3. Annual Plan of Work

Based on program goals and objectives, the supervisors will request assistance from local, state and federal agencies as needed to develop an annual plan of work.

4. Tax Policies

Possibly the most important but least understood plan implementation device is state and local taxation.

The tax values placed on land are often conservative, resulting in a direct subsidy to the land speculator. The low cost of holding land vacant is normally more than offset by increasing market values. This situation is a direct cause of urban and rural sprawl.

In other cases open land is over assessed according to speculative value because of surrounding development. This situation may be partly remedied by the "Greenbelt" law which now provides that qualifying agricultural land is to be taxed according to current rather than potential use.

5. Zoning

Zoning is an exercise of the police power, i.e., the power of the State to regulate in the interests of the health, safety and general welfare of the public. Some of the purposes of zoning include environmental preservation, limitation of congestion, protection of property values and adequate provision of community services. The County Commissioners may establish zones or districts for different uses of land and may regulate developmental patterns, building use and the area around buildings.

Section 16-4704, R.C.M. 1947, provides that zoning regulations shall be in accordance with the comprehensive plan. Comprehensive ordinances apply to an entire planning area and in the absence of such a plan may place the zoning ordinance in questionable legal status.

If a jurisdiction is experiencing emergency land use problems, a temporary interim zoning regulations may be enacted pending the completion of a comprehensive plan within a reasonable time. Such authority is provided to the county commission in Section 16-4711, R.C.M. 1947.

6. Land Use Regulations

Section 76-109, R.C.M. 1947, provides conservation district supervisors with the authority to formulate land use regulations within the district in the interests of conserving soil and water resources and preventing and controlling erosion. A referendum is then submitted to qualified electors for their approval or disapproval of the regulation.

7. Floodway Management

Conservation districts can contribute data to and become involved in floodway management. Pursuant to the Montana Floodway Management and Regulation Act of 1971, a floodway management program may be carried out as follows:

a. A request for flood delineation studies is made by the local subdivision of government to the Montana Department of Natural Resources and Conservation.

b. Completed studies are used if available, and federal agencies (U.S. Geological Survey, SCS, Corps of Engineers, etc.) are contacted by the Department for technical assistance.

c. After delineation, the Department conducts a public hearing on the establishment of the designed floodway. As a result, floodway lines will be recorded and data furnished to local officials.

d. The local governing body then has a maximum of one year to establish and enforce floodway land use regulations at least as stringent as those established by the Department.

e. After local regulations are in effect, or one year after transmission of the floodway data, permits must be obtained before establishing or altering any artificial obstruction within the designed floodway.

8. Subdivision Regulations

The Montana Subdivision and Platting Act of 1973 requires each local governing body to adopt and enforce subdivision regulations by July 1, 1974. These regulations must meet or exceed state minimum requirements and must contain provisions for an environmental assessment to be submitted by the subdivider. Local review procedures as well as district representation on county planning boards will ensure that the Conservation District is afforded an opportunity to evaluate each proposed subdivision within the district.

B. Assistance

1. Financial and Technical

Major types of assistance available from federal agencies include the Soil Conservation Service and Agricultural Stabilization and Conservation Service programs. In addition, water and sewer facility grants and loans from the Farmers Home Administration and Department of Housing and Urban Development "701" planning grants are also available. Montana Renewable Resource Act provides loans and grants.

2. Private Assistance

A source of help often overlooked in planning and implementation of programs is the private sector. Citizen groups, area banks or industries, and chamber of commerce may be crucial to plan implementation and should be involved in planning throughout the process.

RESOLUTION OF ADOPTION

On May twenty-fourth at Broadus at a regular meeting of the board of supervisors, consisting of Chairman, Walter Archer; Vice Chairman, Gerald Alderman; Secretary-Treasurer, Twila Talcott; and Supervisors, Darrel Hanson, Ben Minow, Carrol Schaffer, and Ron Talcott, did meet and review the prepared Powder River Conservation District program, and after such review did mutually agree and resolve that such district program be adopted.

Signed 24th day of May 1976.

Supervisors:

Walter Archer
Chairman

G. L. Alderman
Vice Chairman

Ronald Talcott
Supervisor

Carrol L. Schaffer
Supervisor

Darrel Hanson
Supervisor

Ben Minow
Supervisor

Twila Jo Talcott
Secretary-Treasurer